

Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

<https://archive.org/details/31761115494072>

CAI FN 55

-57 R 20

(3)



CANADA

Tariff Board

Report (by) *of the Tariff Board in Reference 557.*

THE TARIFF BOARD

Relative to the Inquiry Ordered
by the Minister of Finance
respecting

CHEMICALS

•

VOLUME 10

FERTILIZERS—CHAPTER 31
OF THE BRUSSELS TARIFF NOMENCLATURE

•

Reference No. 120

LIBRARY

NOV 20 1967

★
UNIVERSITY OF TORONTO



Report by
THE TARIFF BOARD

Relative to the Inquiry Ordered
by the Minister of Finance
respecting

CHEMICALS



VOLUME 10

**FERTILIZERS—CHAPTER 31
OF THE BRUSSELS TARIFF NOMENCLATURE**



Reference No. 120

© Crown Copyrights reserved

Available by mail from the Queen's Printer, Ottawa,
and at the following Canadian Government bookshops:

HALIFAX
1735 Barrington Street

MONTREAL
Æterna-Vie Building, 1182 St. Catherine Street West

OTTAWA
Daly Building, Corner Mackenzie and Rideau

TORONTO
221 Yonge Street

WINNIPEG
Mall Center Building, 499 Portage Avenue

VANCOUVER
657 Granville Street

or through your bookseller

Price \$1.50

Catalogue No. FT4-120/10-31

Price subject to change without notice

ROGER DUHAMEL, F.R.S.C.
Queen's Printer and Controller of Stationery
Ottawa, Canada
1967

THE TARIFF BOARD

L.C. Audette, Q.C.	Chairman
G.H. Glass	First Vice-Chairman
F.L. Corcoran, Q.C.	Second Vice-Chairman
G.A. Elliott	Member
E.C. Gerry	Member
Léo Gervais	Member
A. DeB. McPhillips	Member

J.E. Gander
Director of Research

R.F. Lalonde
Secretary

PANEL FOR THIS INQUIRY

L.C. Audette, Chairman
F.L. Corcoran
G.A. Elliott
Léo Gervais

ECONOMIST

M. Rachlis

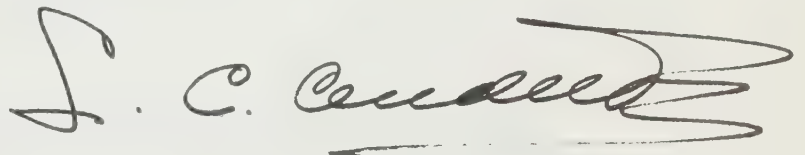
The Honourable Mitchell Sharp, P.C., M.P.
Minister of Finance
Ottawa

Dear Mr. Sharp:

I refer to Mr. Harris' letter of September 21, 1956 and to Mr. Fleming's letters of October 11, 1957 and December 21, 1959 in which the Tariff Board was requested to conduct an inquiry respecting chemicals.

In conformity with Section 6 of the Tariff Board Act, I have the honour to transmit Volume 10 of the Report of the Board, in English and in French. This volume contains the report on fertilizers in Chapter 31 of the Brussels Tariff Nomenclature. Further volumes will be forwarded to you as soon as they have been completed.

Yours sincerely,

A handwritten signature in dark ink, appearing to read "J. C. Cunniff", with a stylized, sweeping flourish extending from the end of the name.

Chairman

Explanation of Symbols Used

- Denotes zero or none reported
- .. Indicates that figures are not available
- * In statistical tables, indicates a reported figure which disappears on rounding, or is negligible
- (a) A small letter in brackets denotes a footnote to a table
- (1) A number in brackets denotes a footnote to the text
- s.c. Denotes a Dominion Bureau of Statistics import or export statistical class

The sum of the figures in a table may differ from the total, owing to rounding

A Note on the Organization of the Report - Reference 120

The first four volumes of the Report by the Tariff Board respecting Reference 120, Chemicals, relate to the reference as a whole; the eleven volumes which follow (Volumes 5 to 15, inclusive) relate to the products which were the subject of the Board's inquiry. The principal subject matter of each of the volumes is given below in terms of the headings of the Brussels Tariff Nomenclature (B.T.N.). Occasionally, chemicals of different B.T.N. headings are dealt with together, for example, chlorine (28.01) and caustic soda (28.17); the more detailed tables of contents of the individual volumes indicate where this occurs.

To the extent that particular statistical tables could be related to specific products or B.T.N. headings they are included in the statistical appendix of the volume which deals with that product or heading. Some tables, which could be related only to broader groupings of chemicals, are included in the statistical appendix to the last volume dealing with such broader groupings: inorganic chemicals in Volume 7, organic chemicals in Volume 9 and artificial resins and plastics in Volume 15.

Because of the unprecedented amplitude and complexity of Reference 120 - Chemicals, many parts of Volumes 5 to 15 were written a considerable time before the first four volumes. This gives rise, occasionally, to apparent discrepancies, attributable to the passage of time, particularly between Volume 4 and those which follow.

Table of Contents for Volumes 1 to 15, inclusive

General Volumes

Volume

1	Recommended Schedule
2	Goods in Recommended Items
3	Goods in Existing Items
4	General Considerations; Summary and Conclusions

Reports on Products

Volume

General Description

B.T.N. Headings

5	Inorganic Chemicals	25.01, 25.03, 28.01 to 28.17, and 28.54
6	Inorganic Chemicals	26.03 and 28.18 to 28.34
7	Inorganic Chemicals	25.32 and 28.35 to 28.58
8	Organic Chemicals	15.10, 15.11, 22.08, 22.09 and 29.01 to 29.13
9	Organic Chemicals	15.10 and 29.14 to 29.45
10	Fertilizers	Chapter 31
11	Dyes, Paints, Inks, Fillers	25.09 and 32.01 to 32.13
12	Detergents; Explosives	34.02, 36.01, 36.02
13	Misc. Chemicals & Preparations	37.08 and 38.02 to 38.19
14	Artificial Resins & Plastics	39.01 and 39.02
15	Artificial Resins & Plastics; Other Portions of Reference 120	39.03 to 39.07 -

Table of Contents of Volume 10*

	<u>Page</u>
Introduction	11
All Fertilizers - Production, Consumption and Trade	12
Tariff Considerations	29
Guano and Other Natural Animal or Vegetable Fertilizers, Whether or Not Mixed Together, But Not Chemically Treated - <u>31.01</u>	42
Mineral or Chemical Fertilizers, Nitrogenous - <u>31.02</u>	44
Introduction	44
Ammonium Nitrate	46
Ammonium Sulphate	54
Calcium Cyanamide	59
Other Products of Heading 31.02	61
Sodium Nitrate (see also 28.39)	62
Liquid Fertilizer - Nitrogen Solutions	63
Mineral or Chemical Fertilizers, Phosphatic - <u>31.03</u>	67
Introduction	67
Superphosphates	67
Other Products of Heading 31.03	73
Basic Slag	73
Other Products	74
Mineral or Chemical Fertilizers, Potassic - <u>31.04</u>	75
Introduction	75
Potassium Chloride	75
Potassium Sulphate	88
Magnesium Sulphate - Potassium Sulphate	92
Other Products of Heading 31.04	94
Other Fertilizers - <u>31.05</u>	95
Introduction	95
Ammonium Phosphates	97
Ammonium Nitrate Phosphate	102
Mixed Fertilizers	103
Other Fertilizers of Heading 31.05	107
Appendices	
I Statistics	109
II Principal Relevant Recommended Items	139

* The numbers shown after product designations are those used in the Brussels Tariff Nomenclature.

FERTILIZERS - B.T.N. CHAPTER 31INTRODUCTION

Fertilizers form one of the oldest groups of materials produced by Canadian industry. They include such common, naturally-occurring materials as excreta, waste parts of animals, rotted vegetable matter and potassic and phosphatic minerals. They also include concentrated chemicals alone or mixed together in precise formulations, specially prepared for use in modern farm machines, by the application of modern technology. Their production may occur at particular locations because of the local occurrence of certain mineral deposits, for example, of potash (potassium chloride); the necessity of disposing of waste sulphur dioxide from chemical or mineral operations frequently gives rise to the production of large quantities of sulphuric acid which, in combination with other materials, provides such common fertilizer compounds as ammonium sulphate, ammonium phosphate and superphosphates.

In spite of a long history, the production and use of fertilizers throughout the world have taken on new magnitude in the past decade, and appear to be undergoing a spectacular advance. Canada, already a major producer of basic fertilizer materials, is well endowed to participate, both at home and abroad, in supplying the upsurge of fertilizer demand. Sales of fertilizers by Canadian producers approximate \$150 million per year, and are increasing rapidly. The international features of the business are of crucial importance to Canada.

Although fertilizer materials have been used in crude form for a long time, their production and use today is not a simple matter. Considerable scientific study of soils, crops and plant nutrients is required to achieve the maximum efficiency from a given crop situation. The manufacturer of fertilizers is expected, more and more, not only to supply custom formulated products to meet local needs, but also to supply highly trained technical personnel to advise in their use. Because the materials are required in great quantities, and because some of them can only be produced economically in large-scale operations, the manufacturer of fertilizers may have several millions of dollars invested in a plant.

With increased knowledge of plant nutrition and of the role played by many chemicals, it has become more difficult to define just what a fertilizer is; a brief outline is given below of the usage of the term "fertilizer".

The Canadian Fertilizers Act defines a fertilizer as

"any substance or mixture of substances containing nitrogen, phosphorus, potassium or other plant food, manufactured, sold or represented for use as a plant nutrient;"⁽¹⁾

(1) Fertilizer Act, 5-6 Elizabeth II, 1957, Chapter 27; and Regulations

The Canadian Customs Tariff uses the word "fertilizers" in tariff items 662, 663 and 663b, without any definition of its meaning, but the Fertilizers Act is used as a guide in administration of the Tariff.

The Brussels Tariff Nomenclature, in Chapter 31, deals with fertilizers mainly in terms of particular products of specified purities. In the Explanatory Notes the statement is made that

"This Chapter covers most products in general use as natural or artificial fertilisers.

The Chapter does not cover lime ... marl and leaf mould ... and peat ..., which improve but do not fertilise the soil."(1)

Under the Canadian Fertilizers Act peat is listed as an organic nitrogen fertilizer. Chapter 31 of the B.T.N. has five major divisions, three of which provide for nitrogenous, phosphatic and potassic fertilizers under headings 31.02, 31.03 and 31.04, respectively. Heading 31.01 provides for natural animal or vegetable fertilizers, and heading 31.05 for "other fertilizers" which are, for the most part, mixtures of the substances of earlier headings of the Chapter, possibly with other materials; the heading also provides for substances which are used as fertilizers but are not included under the other headings.

In Canada, in the U.S.A. and in the countries which have adopted the B.T.N., little difficulty seems to be encountered in defining a fertilizer. Even though the meaning of the term differs somewhat from place to place and from time to time, it retains the general connotation of plant food.

ALL FERTILIZERS - PRODUCTION, CONSUMPTION AND TRADE

The Products

The principal chemical elements that are supplied by fertilizers are nitrogen, phosphorus and potassium. Chemical elements of minor commercial importance for fertilizer use include boron, copper, magnesium, manganese, molybdenum, zinc and others. Fertilizers may be of animal, vegetable or mineral origin; they may be used as they occur in their natural state or they may be subjected to varying degrees of processing; and they may be mixtures of any combination of the foregoing.

Large numbers of products have fertilizing properties, but few are so abundant and cheap as to be used widely as fertilizers or for the manufacture of fertilizers. In Canada seven products account for a large proportion of the materials purchased for direct application to the soil or for the manufacture of mixed fertilizers. In the crop year 1963-64 four of these accounted for 80 per cent of the materials purchased for direct application to the soil. Similarly, three products which are used for the manufacture of mixed fertilizers constituted 85 per cent of the value of materials purchased for this purpose. It should be noted that these figures apply only to purchased materials. They exclude the materials which are produced captively by manufacturers of fertilizer materials or mixed fertilizers.

(1) Explanatory Notes, Vol. 1, p. 305

The materials which are sold for direct application are shown in the following table together with materials purchased for the manufacture of mixed fertilizers; the data exclude captive production of these materials. Also not included in the table are many other materials, for example, sulphuric acid, nitric acid and ammonia, purchased or produced for the manufacture of fertilizers; some of the more important of these are noted hereunder.

The statistics relating to direct application are for crop years beginning July 1 and those relating to manufacturing use are for calendar years. The calendar year 1962, for example, would be roughly comparable with the crop year of 1961-62.

Selected Major Products Sold in Canada for Direct Use as Fertilizers,
and Purchased for the Manufacture of Fertilizers, 1961-64

	For Direct Application ^(a)			For Manufacturing	
	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1961</u>	<u>1962</u>
	'000 ton			'000 ton	
Superphosphates	36	37	39	428	440
Phosphate Rock	1	1	1	239 ^(b)	340 ^(b)
Ammonium phosphates	175	233	306	11	11
Potassium chloride	9	14	21	155	170
Ammonium nitrate	55	74	98	6	5
Ammonium nitrate phosphate	18	31	51	-	-
Nitrogen solutions	7	8	19	51	58
Others	<u>44</u>	<u>50</u>	<u>75</u>	<u>82</u>	<u>80</u>
Total Use	345	448	610	733	764

(a) Crop years July 1 to June 30

(b) Not added into the total, to avoid double counting

Source: Compiled from D.B.S., Fertilizer Trade, Cat. No. 46-207 and The Fertilizer Industry, Cat. No. 46-220

For direct application to the soil, four products account for about 80 per cent of total purchases; these are ammonium phosphate, ammonium nitrate, ammonium nitrate phosphate and superphosphates. For use in the manufacture of mixed fertilizers the three fertilizer products of outstanding importance in commercial trade are superphosphates, phosphate rock and potassium chloride (potash). These constitute about 85 per cent of the purchased materials. However, it should be noted that the table refers only to purchased fertilizer materials; it excludes captively produced and other purchased raw materials such as sulphuric acid, ammonia, urea, phosphoric acid and nitric acid, all of which are used in very large quantities.

The phosphate rock, sulphuric acid and ammonia are used to produce the various fertilizer chemicals. Mixed fertilizers are produced by mixing the above fertilizer chemicals with potash and frequently with other chemicals some of which are not themselves considered to be fertilizers.

Usually, when for use as fertilizers or fertilizer materials, chemicals of lower purity are used than when they are for other purposes such as production of chemicals. However the fertilizer grades of some products are of sufficiently high purity to be used in the manufacture of other chemicals. The question of grades and degree of purity is dealt with in more detail in the sections on the individual fertilizer chemicals.

Products such as ammonium phosphate are regarded as "straight" fertilizers because they consist of only one active chemical even though they supply more than one of the three essential constituents, nitrogen, phosphorus and potassium. Two common forms of ammonium phosphate fertilizer which are sold are designated as "11-48-0" and "16-20-0". The first number in each case specifies the total percentage content, by weight, of nitrogen; the second number relates to the available phosphorus pentoxide, and the third number refers to the soluble potash contained in the mixture, calculated in terms of potassium oxide (K_2O). Thus, ammonium phosphate 16-20-0 is a straight fertilizer because all the active ingredients are obtained from one compound, but 8-16-0 and 10-20-0 are mixed fertilizers because the active ingredients are obtained by mixing two or more chemical substances.

Most of the commercial mixed fertilizers are called "complete" fertilizers because they contain nitrogen, phosphorus and potassium; they may also contain other ingredients such as other chemical elements or herbicides. The commercial mixed fertilizers are selectively formulated for different kinds of soils and crops, and a large number of formulations are available.

As was noted earlier, in Canada the principal materials that are purchased for direct application are ammonium phosphate, ammonium nitrate and ammonium nitrate phosphates. These supply nitrogen and phosphoric acid. From the following tabulation, it can be seen that about two-thirds of the nitrogen and more than one-half of the phosphorus were derived from straight fertilizers in 1963-64. In contrast, only about ten per cent of the potash was derived from straight fertilizers.

Sales in Canada of Fertilizer Materials and Mixed Fertilizers
According to Their Content of Nitrogen, Phosphoric Acid and Potash,
Crop Years, 1959-64

Crop Year Ended June 30	Nitrogen		Phosphoric Acid		Potash (as K_2O)	
	Materials	Mixtures	Materials	Mixtures	Materials	Mixtures
	'000 tons		'000 tons		'000 tons	
1959	33	29	50	95	4	84
1960	37	31	58	96	4	85
1961	49	36	68	109	5	97
1962	59	39	81	116	7	100
1963	80	42	105	118	10	102
1964	119	47	139	126	14	107

When a material is applied to the soil as a straight fertilizer, it must be in a form that will flow freely and will not cake and consequently plug the orifices of the farm machines that are used to apply it. To achieve the desired free-flowing properties some fertilizers are "prilled". Prilling involves processing the product in high towers so that small granules are formed; these are usually coated with a material such as diatomaceous earth to prevent the particles from adhering to each other. Any prilled material is regarded in Canada for tariff purposes as a manufactured fertilizer.

A problem arises in mixed fertilizers because some of the materials may be heavier than others and tend to settle. Thus, a mixed fertilizer, formulated from materials of varying weight per unit volume, can readily become stratified with the result that the active ingredients are not contained uniformly throughout the mixture. This problem can be resolved by "granulation", which involves the processing of two or more materials into a granular form so that each resulting granule contains the essential constituents in approximately the proportion that is intended for the whole mixture.

The Industry

The plants in which fertilizer materials or mixed fertilizers are manufactured have generally been built to carry out the operations necessary for such production. However, some of the companies which operate these plants are engaged more particularly in mining, mineral processing, meat packing, sewage disposal or chemical production. Some of the plants are an integral part of other production but a great many are separate operations.

In 1964 there were 79 establishments which either manufactured straight or mixed fertilizers, or distributed fertilizers at the wholesale level. Of these, 45 manufactured mixed fertilizers; 12 produced straight fertilizers or materials used in the production of mixed fertilizers, and 22 were essentially wholesale distributors or packagers, although some may have engaged in minor processing operations.

The production of straight fertilizers and raw materials which are used by mixers is usually done in large plants, while the manufacture of mixed fertilizers is sometimes undertaken in smaller establishments. The operations of the producers of single chemicals are discussed in some detail under headings 31.02 (ammonium nitrate, ammonium sulphate, calcium cyanamide); heading 31.03 (superphosphates); heading 31.04 (potash), and heading 31.05 (ammonium phosphates). Among the producers of straight fertilizers and of the important fertilizer materials are such firms as Brockville Chemicals Limited, Canadian Industries Limited, Consolidated Mining and Smelting Company of Canada, Limited, Cyanamid of Canada Limited, Electric Reduction Company of Canada Limited, International Minerals and Chemicals Corporation (Canada) Limited, Northwest Nitro-Chemicals Limited, and Sheritt Gordon Mines Limited. As noted above, the straight fertilizers and the raw materials entering into the manufacture of fertilizers are dealt with in more detail in other parts of this report, mostly under later headings of this B.T.N. chapter.

In 1962 there were 26 companies with 45 establishments which manufactured mixed fertilizers. Six companies accounted for 25 of the plants. These were: Agricultural Chemicals Limited, Canada Packers Limited, Canadian Industries Limited, International Fertilizers Limited, Swift Canadian Company Limited and United Co-operatives of Ontario.

Mixed fertilizers are used mainly outside the Prairie Provinces; straight fertilizers account for most of the use on the Prairies. As a result, only one mixed fertilizer plant was reported in the Prairie Provinces. Twenty-seven of the remaining 44 establishments were reported to be in Ontario.

In 1962 the 45 plants employed 1,562 employees who were paid a total of \$7.3 million in that year in wages and salaries. Shipments of goods of their own manufacture approached \$60 million. It should be noted that these shipments include sales of fertilizer materials valued at \$13.4 million and sales of mixed fertilizers valued at \$46.4 million, 78 per cent of the total. The cost of materials is a very large part of the value of shipments for the mixed fertilizer industry, amounting to 74 per cent in 1962.

The principal statistics for the mixed fertilizer industry, by region, are given below.

Manufacturers of Mixed Fertilizers, Selected
Statistics, by Region, 1962

		<u>Atlantic Provinces</u>	<u>Quebec</u>	<u>Ontario</u>	<u>Prairies & B.C.</u>	<u>Canada</u>
Establishments	No.	7	6	27	5	45
Production Workers	No.	164	241	520	25	950
Total employees	No.	208	391	919	44	1,562
Salaries & Wages	\$'000	789	1,943	4,366	189	7,287
Shipments	\$'000	8,714	13,903	35,798	1,203	59,618
Value added (a)	\$'000	1,933	4,754	9,188	267	16,142

(a) Value added here refers to value of production minus cost of materials, fuel and electricity

Source: D.B.S., Manufacturers of Mixed Fertilizers, Cat. No. 46-220

The importance of Ontario and Quebec as producers of mixed fertilizers is apparent from the preceding tabulation. Ontario alone accounted for 60 per cent of the value of shipments of mixed fertilizers in 1962. Ontario and Quebec together accounted for more than 80 per cent of the total in that year and shipments by plants in the Atlantic Provinces were 15 per cent of the total. Sales of mixed fertilizers by plants west of Ontario were slightly more than \$1 million, less than three per cent of total shipments. Because four of the five plants in this region were in British Columbia, it is probable that a large part of these sales were in that province.

Most of the mixed fertilizers are produced in large plants whose annual value of shipments ranges from \$1 million to more than \$5 million annually. In 1962 about 80 per cent of the total value of shipments was by 20 plants, each with sales of \$1 million or more. In contrast to these larger plants, there were four whose combined sales in 1962 were only \$175,000 and nine others whose combined sales were approximately \$2.5 million.

Manufacturers of Mixed Fertilizers, Classified by
Value of Shipments of Goods of Own Manufacture,
1961 and 1962

Value of Shipments of Own Manufacture	1961			1962		
	No. of Plants	Value of Shipments	Average Value of Shipments	No. of Plants	Value of Shipments	Average Value of Shipments
	no.	\$'000		no.	\$'000	
Less than \$100,000	5	486	97	4	175	44
\$100,000 to \$499,999	6	1,907	318	9	2,489	276
\$500,000 to \$999,999	11	7,571	688	12	8,410	701
\$1,000,000 to \$4,999,999	21	44,298	2,109)	20	48,542	2,427
\$5,000,000 and over	-	-	-)			
Total	43	54,261	1,262	45	59,618	1,325

Source: D.B.S., Manufacturers of Mixed Fertilizers, Cat. No. 46-220

At the public hearing in May 1962, the manufacturers informed the Board that there is essentially no long-distance movement of mixed fertilizers because of the relatively high costs of transportation. Their spokesman said that plants are built wherever a sufficient demand arises for the products and that imports and exports of compounded fertilizers are small. He also said there is virtually no movement of mixed fertilizers east and west.⁽¹⁾

The spokesman emphasized that differences in soils and crops made necessary the compounding of a large variety of mixed fertilizers. Companies supplied special services to farmers including soil testing and visits from trained field staff. The principal duty of the field staff is to recommend the most appropriate fertilizer for the soil and the crop concerned. The lack of such services in connection with imported fertilizers was put forward as one reason for the relatively small volume of imports.

⁽¹⁾ Transcript, Vol. 81, p. 12399, 12410

The very rapid increase in the use of fertilizers in Canada and throughout the world has resulted in a considerable expansion of production and sales of almost all basic fertilizer materials and mixed fertilizers. As a result, producers throughout the entire industry have been able to participate in supplying the growing demand. The potassic materials have, of course, experienced the most spectacular gain because of the potash development in Saskatchewan. The phosphoric fertilizers, including for example the superphosphates and ammonium phosphate, have also experienced substantial advances, necessitating much larger imports of phosphate rock, the principal component of Canada's imports of fertilizer materials or of fertilizers. Production and sales of nitrogenous fertilizers have made less pronounced gains in recent years with exports levelling off, partly as a result of the rapidly increasing domestic demand for nitrogenous materials. However, large increases in Canadian productive capacity for ammonia and urea, two major sources of nitrogen, are under way or are projected for the next few years. The rate of growth of the nitrogenous group is therefore also likely to be very pronounced as the capacity to supply ammonia and other nitrogenous materials increases to support the rapid increase both in domestic utilization and in exports.

The Market

Sales of Fertilizers

Canadian consumption of fertilizers, in the crop year, July 1, 1963 to June 30, 1964, was 845,000 tons of mixed fertilizers and 610,000 tons of straight fertilizers with an estimated value of approximately \$95 million. In addition, export sales amounted to about \$75 million. Imports of fertilizers and materials amounted to about \$28 million in the crop year 1963-1964.

Sales of mixed fertilizers and fertilizer materials have been increasing rapidly in recent years. Combined sales, domestic and export, more than doubled in the decade from 1955 to 1964; most of the increase occurred in the 1960's. The largest increases have been in sales of fertilizer materials, both domestic and export, but there has also been a substantial increase in sales of mixed fertilizers in Canada.

The table which follows is in terms of the tonnages sold. The figures represent a wide variety of materials and mixtures which vary considerably in the concentration of the fertilizer ingredients; they therefore include a substantial weight of inert material. For example, in the crop year, 1963-64, domestic and export sales combined totalled 3.4 million tons of which only 1.5 million tons, less than one-half of the total, consisted of contained nitrogen, phosphorus pentoxide and potassium oxide.

In the decade, 1955 to 1964, the largest increase in both domestic and export sales combined has been in potassic fertilizer (potash), but substantial increases have also occurred in sales of nitrogenous and phosphatic fertilizers. Domestic sales of potassic fertilizers have not been as important as those of nitrogenous and phosphatic fertilizers and, until 1962, Canada imported most of her supplies of potassium chloride, the major potassic fertilizer material. However, the current development of Saskatchewan's vast and very rich

potash deposits has resulted in large export sales. In the crop year, 1963-64, exports of potash were valued at approximately \$28 million, one-third of the total value of exports in that year; only two years previously Canada was importing all of her supplies of potash, at an annual cost of about \$4.4 million.

Sales of Fertilizer Materials and Mixed Fertilizers,
Selected Years, 1954-55 to 1963-64

Crop Year Ended <u>June 30</u>	<u>Fertilizer Materials Sold</u>			<u>Mixed Fertilizers Sold</u>		
	<u>Canada</u>	<u>Exported</u>	<u>Total</u>	<u>Canada</u>	<u>Exported</u>	<u>Total</u>
		'000 tons			'000 tons	
1954-55	139	782	921	651	36	687
1956-57	156	854	1,011	652	50	701
1959-60	244	919	1,162	692	50	742
1960-61	298	924	1,222	780	53	832
1961-62	345	862	1,207	799	61	860
1962-63	448	1,377	1,825	809	84	893
1963-64	610	1,816	2,425	845	145	990

Percentage Change

1955-60	+ 76	+18	+ 26	+ 6	+ 39	+ 8
1960-64	+150	+98	+109	+22	+190	+33

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207

The following table shows the breakdown of domestic and export sales according to the nitrogen, phosphoric acid and potash contained. From the data it is apparent that sales of nitrogen are largely in the form of materials for direct application, while sales of potash, until 1962, were mainly in the form of mixtures. Since 1962, the most significant development has been the large increase in export sales of potash. Sales of phosphoric acid have increased substantially both in materials for direct application and in mixed fertilizers.

The second table which follows shows the relative importance of domestic and export sales with respect to the principal chemical ingredients. The figures show that nitrogenous fertilizers, which accounted for about 70 per cent of the exports in the mid-fifties, have declined in relative importance as exports of phosphatic, and more recently, potassic fertilizers have increased. It is also apparent that until 1962 the domestic market was expanding more rapidly than the export market but, again largely because of the impact of the potash developments in Saskatchewan, export sales have experienced a very substantial increase since then.

Nitrogen, Phosphoric Acid and Potash Contained in
Fertilizers Sold in Canada and Exported, Selected
Years, 1954-55 to 1963-64

Crop Year Ended June 30	In Materials Sold			In Mixtures Sold		
	Nitrogen	Phosphoric	Potash	Nitrogen	Phosphoric	Potash
		Acid	(as K ₂ O)		Acid	(as K ₂ O)
		'000 tons			'000 tons	
1954-55	194	97	4	28	86	76
1956-57	216	101	5	31	93	82
1959-60	249	148	4	35	103	91
1960-61	277	159	9	41	118	103
1961-62	273	181	7 ^(a)	45	127	107
1962-63	302	195	322 ^(a)	50	130	112
1963-64	301	216	656 ^(a)	57	151	120

Percentage Change

1955-60	+28	+53	-	+25	+20	+20
1960-64	+21	+46	(very large)	+63	+47	+32

(a) Partly estimated

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207

Nitrogen, Phosphoric Acid and Potash Contained in Fertilizer
Materials and Mixtures, Sold in Canada and Exported,
Selected Years, 1954-55 to 1963-64

Crop Year Ended June 30	Sold in Canada				Exported			
	Nitro- gen	Phos- phoric	Potash	Total	Nitro- gen	Phos- phoric	Potash	Total
		Acid	(as K ₂ O)			Acid	(as K ₂ O)	
		'000 tons				'000 tons		
1954-55	43	115	74	232	179	69	5	253
1956-57	50	121	78	249	197	73	9	278
1959-60	68	153	89	310	216	98	6	320
1960-61	86	177	102	365	233	100	10	343
1961-62	98	197	106	401	220	111	7 ^(a)	338
1962-63	122	223	112	457	230	102	321 ^(a)	653
1963-64	166	264	121	551	192	103	655 ^(a)	950

Percentage change

1955-60	+ 58	+33	+20	+34	+21	+42	+20	+ 26
1960-64	+144	+73	+36	+78	-11	+ 5	(very large)	+197

(a) Partly estimated

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207

As the foregoing analysis indicates, there is a large and expanding market in Canada for fertilizer materials and mixed fertilizers. In terms of quantities sold and disregarding their chemical content, sales of mixed fertilizers, in 1963-64 were 845,000 tons compared with sales of fertilizer materials, for direct application, of 610,000 tons. However, the use of straight fertilizers is increasing even more rapidly and sales of these are overtaking sales of mixed fertilizers. In 1959-60, sales of materials were only one-third as large as sales of mixed fertilizers; in 1963-64, only four years later, sales of materials were more than two-thirds those of mixed fertilizers.

The fertilizer materials which are sold in Canada contain mainly nitrogen and phosphoric acid; the mixed fertilizers contain mainly phosphoric acid and potash. In 1963-64 the nitrogen contained in materials sold was 119,000 tons compared with a nitrogen content of only 47,000 tons in mixed fertilizers sold. In contrast mixed fertilizers sold domestically contained 107,000 tons of potash compared with only 14,000 tons in materials sold. For phosphoric acid, the amounts sold in materials and in mixtures were far more even, amounting to 139,000 and 126,000 respectively in the crop year 1963-64.

The principal materials which are applied directly are ammonium phosphate, ammonium nitrate, ammonium nitrate phosphate, superphosphates and ammonium sulphate. None of these five materials contains potash which is applied directly but not in substantial quantities compared with the other products, or compared with the amount of potash used in mixtures. The five products accounted for about 85 per cent of all of the materials used for direct application to the soil. As indicated earlier, the principal basic raw materials of the mixed fertilizer industry are such products as phosphate rock, potash, sulphuric acid and ammonia. The fertilizer materials used in the actual mixing processes are products such as superphosphates, ammonium nitrate, ammonium sulphate, urea and potash.

Regional Distribution of the Market

The Canadian market for fertilizers shows distinct regional differences with respect to the form used (straight or mixed fertilizer), the concentration and the contained constituents. The Prairie Provinces' consumption is essentially in the form of fairly concentrated straight materials, which contain mainly phosphoric acid and nitrogen. Ontario consumes large quantities of straight fertilizers but these are only one-quarter of the quantity consumed as mixed fertilizers. Fertilizers sold in Ontario are relatively evenly balanced with respect to their content of nitrogen, phosphoric acid and potash. In Quebec and the Atlantic Provinces the demand is mainly for mixed fertilizers whose nitrogen content is considerably less than their content of the other two ingredients. British Columbia uses both straight and mixed fertilizers which are relatively higher in nitrogen content than in the other constituents.

The Prairie Provinces and Ontario are the two major market areas for straight fertilizers. Together they accounted for 93 per cent of total sales of these in 1963-64; sales in the Prairies alone were almost two-thirds of the Canadian total.

Sales of Fertilizer Materials and Mixed Fertilizers,
by Region, Crop Year Ended June 30, 1964

	<u>Sales</u>			<u>Per Cent of Sales</u>		
	<u>Materials</u>	<u>Mixtures</u>	<u>Total</u>	<u>Materials</u>	<u>Mixtures</u>	<u>Total</u>
	'000 tons			per cent		
Atlantic						
Provinces	5	158	163	0.8	18.7	11.2
Quebec	16	177	193	2.6	20.9	13.2
Ontario	166	485	651	27.2	57.4	44.8
Prairies	399	4	403	65.5	0.5	27.7
B.C.	<u>24</u>	<u>21</u>	<u>45</u>	<u>3.9</u>	<u>2.5</u>	<u>3.1</u>
Canada	610	845	1,454	100.0	100.0	100.0

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207

The principal market for mixed fertilizers is in Ontario. In 1963-64, sales of these in Ontario were 57 per cent of total Canadian sales. Quebec and the Atlantic Provinces each accounted for about 20 per cent of sales, British Columbia for only 2.5 per cent, and the Prairies for a negligible amount.

Regional differences in soils and crops give rise to different regional needs for particular fertilizer ingredients. For example, in 1963-64, Ontario took 45 per cent of all the fertilizer materials and mixtures sold in Canada, but 63 per cent of the sales of contained potash. In contrast, 28 per cent of all sales were in the Prairie Provinces but less than one per cent of the potash sold was in this region.

The table which follows shows the relative importance of the various regions as markets for each of the major fertilizer components; it also shows the average percentage distribution of the components in each region. The data indicate that the demand for phosphatic and nitrogenous fertilizers is largely in the Prairie Provinces and Ontario and that the demand for potassic fertilizers is mainly in Ontario and Quebec. The demand for potash is smallest in the Prairies, the region in which all of Canada's production is concentrated.

Sales of Fertilizer Materials and Mixed Fertilizers, Percentage
Distribution by Region, According to Contained Nitrogen,
Phosphoric Acid and Potash, Year Ended June 30, 1964

	<u>Per Cent of Sales in Canada</u>			<u>Per Cent of Sales in Region</u>		
	<u>Nitrogen</u>	<u>Phosphoric Acid</u>	<u>Potash (as K₂O)</u>	<u>Nitrogen</u>	<u>Phosphoric Acid</u>	<u>Potash (as K₂O)</u>
Atlantic						
Provinces	6.4	7.7	14.3	22	42	36
Quebec	5.9	11.2	20.2	16	46	38
Ontario	42.0	33.1	62.8	30	38	32
Prairies	41.9	45.4	0.4	36	63	*
B.C.	<u>3.8</u>	<u>2.6</u>	<u>2.3</u>	<u>39</u>	<u>43</u>	<u>18</u>
Canada	100.0	100.0	100.0	30	48	22

Source: Derived from D.B.S., Fertilizer Trade, Cat. No. 46-207

Seasonality of Fertilizer Trade

Fertilizers are used in Canada mainly in the spring and summer, the heaviest use generally being in the spring. As a result, manufacturers of fertilizers must arrange for storage of the products in order to try and equalize their output during the rest of the year. The available data suggest that production of fertilizer materials is fairly regular throughout the year although there is a noticeable increase in May, the peak month for production and sales of materials and mixed fertilizers.

The seasonal variation in production and sales of mixed fertilizers is readily apparent. In 1963 and 1964, as in other years, the average monthly production of mixed fertilizers rose at the beginning of the year; it reached a peak of 135,000 tons in May and then declined to 28,000 tons in July, about one-fifth of the output in May. In July, at their low, shipments were valued at only one million dollars compared with \$15 million in May when they accounted for 25 per cent of annual sales in 1963 and 1964.

Employment by months reflects the seasonal variation in production and shipments. In April and May, the peak months, about twice as many persons are employed by the mixed fertilizer industry as are employed in July. In 1962 the industry employed 1,338 production and related workers in April and 1,411 in May; in July the number employed was 740 and in August 756. There is much less variation in employment between September and March.

As would be expected, inventories reach their peak in March, just before shipments begin to move towards their seasonal high. In the two years, 1963 and 1964, inventories at the end of March averaged \$20 million in value; by the end of June they were only \$8 million.

The following table shows the average monthly data for production, shipments, inventories and employment. These data apply to the mixed fertilizers industry. However, some of the producers of mixed fertilizers also manufacture such straight products as ammonium phosphate, ammonium sulphate and ammonium nitrate for which the seasonal variation is also substantial, though less pronounced than for mixed fertilizers.

Production, Shipments, Inventories Held and Employment by the
Mixed Fertilizers Industry; Production of Ammonium
Nitrate and Ammonium Sulphate, by Months,
Average 1963 and 1964

	Mixed Fertilizers Industry				Ammonium Nitrate	Ammonium Sulphate
	Production	Shipments	Inventories(a)	Employment(b)	Production	Production
	'000 tons	\$ million		nos.	'000 tons	
Jan.	84.6	5.0	17.9	990	43.1	24.0
Feb.	89.4	5.5	18.5	942	40.8	21.2
March	112.6	4.7	19.6	945	39.2	22.7
April	123.4	8.7	17.7	1,338	36.7	26.9
May	134.6	15.1	8.8	1,411	38.8	27.7
June	58.8	5.5	7.8	844	33.2	27.3
July	28.2	1.0	8.5	740	31.8	22.0
Aug.	41.8	1.1	11.0	756	36.0	32.0
Sept.	73.3	3.4	13.0	847	35.2	22.1
Oct.	76.2	2.4	15.6	850	36.5	23.2
Nov.	77.0	2.6	17.4(c)	860	34.2	24.7
Dec.	82.9	5.0(c)	16.3(c)	891	40.0	32.6
Total	982.8	60.0	-	-	445.5	306.4

(a) At end of month shown

(b) Production and related workers; 1962, latest year available

(c) 1963 only

Source: D.B.S. Inventories, Shipments and Orders in Manufacturing Industries, Cat. No. 31-001; Manufacturers of Mixed Fertilizers, Cat. No. 46-220; Specified Chemicals, Cat. No. 46-002

Prices

In general, chemical fertilizers have a relatively low value per ton and even the most concentrated single fertilizer chemicals are sold at less than \$100 per ton. This low value is partly because the purity of the materials is usually of little consequence. For other applications the presence of even very small percentages of some adulterants may make the product unsuitable for use, necessitating costly refining processes. Thus, although many fertilizer chemicals are highly concentrated, few of them cost more than \$50 a ton. Generally speaking, the most expensive fertilizer chemicals are those that supply nitrogen and the least expensive are the crude materials such as phosphate rock and potash.

Prices of fertilizer materials are published regularly in the U.S.A., but are not available in Canadian publications. Prices of mixed fertilizers are not published, probably because their formulae vary so widely with local requirements of the soils and the wide variety of crops for which they are used. A selection of the more important fertilizer chemicals is tabulated on the following page. In all cases the fertilizer grade is given, if quotations are available, and all prices are for bulk product, f.o.b. works, unless otherwise noted.

Prices of Fertilizer Chemicals, in the U.S.A., at June 8, 1964
and February 1 and March 15, 1965

	<u>1964</u> June 8	<u>1965</u> Feb. 1	<u>March 15</u>
	\$U.S. per ton		
Ammonia anhydrous	92.00	92.00	92.00
Ammonium nitrate, Canadian, 33.5% N	70.00	70.00	70.00
Ammonium phosphate, 18% N, 46% P ₂ O ₅ , f.o.b. vessel	80.50	76.75	80.50
Ammonium sulphate, standard, granular	41.00	33.00	33.00
Calcium cyanamide, 21% N, Niagara Falls	59.00	..	..
Nitrogen solutions per unit ton; assuming 22% N	1.64 36.08	1.64 36.08	1.64 36.08
Phosphate rock, Florida, 70% B.P.L.	44.24	47.32	47.32
Potassium chloride, 60% K ₂ O	24.00	24.00	25.80
Potassium sulphate, 50% K ₂ O	38.00	38.00	39.50
Superphosphate, 20% avail. P ₂ O ₅	18.60	18.60	19.20
Triple superphosphate, 46% P ₂ O ₅ , f.o.b. vessel	48.30	48.30	50.60
Urea, delivered, 45% Nitrogen	90.00	90.00	90.00

Source: Oil, Paint and Drug Reporter

Transportation Costs

Because costs of freight for long-distance shipment are high relative to the costs of the products, the commercial trade in mixed fertilizers tends to be regional, or even local, whereas the trade in fertilizer chemicals occurs even between distant points. Another factor also tends to limit the distance that mixed fertilizers can be shipped economically. The formulations that are sold in the largest volume are not highly concentrated and contain a considerable amount of inert matter. For example, of the more than 100 formulations sold in the 1963-64 crop year, six accounted for slightly more than one-half of the total volume of sales. The most concentrated of the six was 4-24-20 (4 per cent nitrogen, 24 per cent available phosphoric acid and 20 per cent available potash in terms of potassium oxide (K₂O) content). In contrast, ammonia contains more than 80 per cent of nitrogen, triple superphosphate is 46 per cent phosphoric acid equivalent, and the agricultural grade of potassium chloride is a minimum of 60 per cent of potassium oxide.

The lowest cost of shipping mixed fertilizers from Montreal or Toronto to Winnipeg is \$33.40 a ton, and to Saskatoon it is \$48 a ton. For many mixed fertilizers the freight cost to Winnipeg would be about one-third to one-half of the f.o.b. cost at the point of origin.

Foreign Trade

Because the cost of transportation and differences in local requirements make it economic to establish mixed fertilizer plants in the general area of use, foreign trade in mixed fertilizers is small and the international movement of fertilizers is largely in the form of fertilizer materials. In 1964, Canadian exports of all fertilizers and materials were valued at \$86.8 million and imports, at \$27.8 million. Mixtures constituted less than three per cent of the total value of imports; exports of mixed fertilizers, which were about three times their usual level, were 11 per cent of the total value of exports.

Canada's exports and imports tend to be complementary. Western Canada exports potash, ammonium nitrate, ammonium phosphate and ammonium sulphate and imports large quantities of phosphate rock. Eastern Canada exports nitrogenous materials, such as ammonia and urea, and some fertilizer compounds; it imports large quantities of potash, phosphate rock and superphosphates. Imports have not increased appreciably in the past four years.

Canada's exports have greatly exceeded imports for many years and the net export margin has been increasing rapidly. Recent developments indicate further large increases in the next few years, particularly as a result of larger exports of Saskatchewan potash and continuing increases in exports of the traditional materials of western Canada. A large increase in the exports of nitrogenous and phosphatic materials from Ontario and Quebec is also probable. In 1964 Canadian exports of fertilizers exceeded imports by almost \$60 million; five years previously, in 1959, total exports were less than \$50 million and the net export margin was \$29 million, only one-half of the 1964 net balance.

Canadian Exports and Imports of Fertilizers and Fertilizer Materials, 1959-64

	<u>Imports</u>	<u>Exports</u>	<u>Net Exports</u> ^(a)
	- '000 dollars -		
1959	20,267	49,390	29,123
1960	22,545	52,801	30,256
1961	25,893	53,554	27,661
1962	26,018	60,250	34,232
1963	25,312	74,756	49,444
1964	27,833	86,750	58,917

(a) Exports minus imports

Source: D.B.S., Trade of Canada, Imports and Exports

Until 1962 Canada's foreign trade in fertilizer materials was almost entirely with the U.S.A. Since 1962, Canada has begun to export Saskatchewan potash in increasing amounts to countries other than the U.S.A. However, Canadian imports have continued to be mainly from the U.S.A.

Canada exports about one-half of her output of fertilizers and the proportion that is exported is likely to become much larger mainly as a result of greatly increased exports of potash but also because of larger exports of processed nitrogenous and phosphatic materials. The proportion of total sales of each of the major constituents which have been exported is shown below and indicates the changes which have occurred during the past decade.

Export Sales as a Percentage of Total Sales According to
Principal Plant Nutrients Contained, Selected Years,
1954-55 to 1963-64

Years Ended June 30	<u>Total Sales</u>				<u>Per Cent Exported</u>			
	Nitro- gen	Phos-	Potash	<u>Total</u>	Nitro- gen	Phos-	Potash	<u>Total</u>
		phoric Acid	(as K ₂ O)			phoric Acid	(as K ₂ O)	
		- '000	tons	-		-	per cent	-
1954-55	222	183	80	485	81	38	6	52
1959-60	284	252	95	631	76	39	6	51
1961-62	319	308	114 ^(a)	740 ^(a)	69	36	6	46
1962-63	352	325	433 ^(a)	1,111 ^(a)	65	31	74	59
1963-64	358	367	776 ^(a)	1,501 ^(a)	54	28	84	63

(a) Partly estimated

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207; Trade of Canada, Exports, s.c. 41699; U.S. Imports for Consumption, FT-110

Peat moss was excluded from the export data which have been cited although it is mentioned as a nitrogenous fertilizer material in the regulations under the Fertilizers Act. Although it supplies small amounts of nitrogen to the soil, the product is often regarded as being more correctly described as a soil conditioner rather than as a fertilizer. Canadian exports of peat moss are very substantial and are currently about \$10 million annually. Virtually all exports of peat moss are to the U.S.A. and almost all of the product which is exported is designated in the U.S.A. import statistics as being of "fertilizer grade".

As mentioned earlier, Canadian imports are largely of crude, raw materials for further processing. In 1964, imports of phosphate rock and potash were valued at \$13.7 million, almost 50 per cent of the value of total imports. Imports of superphosphates were valued at \$5.8 million and the remaining \$8.3 million was made up of a number of other materials. About 90 per cent of Canadian imports were from the U.S.A.

Exports of Selected Fertilizers and Fertilizer Materials,
1961-64

	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
		- \$'000 -		
Potash ^(a)	*	1,634	12,965	19,365
Ammonium nitrate	9,057 ^(a)	11,630	13,144	11,012
Urea, all types	3,314 ^(a)	5,483	6,906	9,194
Ammonium sulphate	7,417	7,103	6,544	6,057
Ammonium phosphates ^(a)	7,075	9,274	7,153	5,812
Superphosphates ^(a)	171	2,783	2,917	3,991
Nitrogen solutions ^(a)	3,174	3,360	3,658	3,561
Other fertilizer materials ^(b)	19,994	15,472	18,717	18,378
Mixed fertilizers	<u>3,352</u>	<u>3,511</u>	<u>2,752</u>	<u>9,380</u>
Total Exports	53,554	60,250	74,756	86,750

(a) Imports into the U.S.A. from Canada, in U.S. dollars

(b) "Other fertilizer materials" by subtraction from total in Canadian Trade statistics

Source: D.B.S., Trade of Canada, Exports; U.S., Dept. of Commerce, Imports for Consumption, FT-110

Imports of Selected Fertilizers and Fertilizer Materials,
1961-64

	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
		- \$'000 -		
Phosphate rock	9,679	10,843	12,204	11,719
Potassium chloride	4,402	4,367	2,096	1,955 ^(a)
Superphosphates	5,624	4,795	3,665	5,827 ^(a)
Phosphate fertilizer, n.o.p.	569	1,844	3,289	..
Sodium nitrate	826	921	893	1,080
Nitrogen solutions	1,838	481	515	1,058
Potassium sulphate	1,023	957	758	825
Other fertilizer materials	1,109	1,252	1,355	4,649
Mixed fertilizers	<u>823</u>	<u>558</u>	<u>537</u>	<u>720</u>
Total Imports	25,893	26,018	25,312	27,833

(a) Includes phosphate fertilizer, n.o.p.

Source: D.B.S., Trade of Canada, Imports

In 1963, Canada's imports of potassium chloride were valued at \$2.1 million and exports to the U.S.A. alone, at \$14 million. In 1964, Canadian exports of potash to the U.S.A. were valued at about \$21.0 million and large quantities were also exported to other countries. The development of Canada's potash deposits is continuing at a rapid rate and before the end of the present decade Canada is expected

to become the world's largest exporter. However, in spite of this, it is probable that potash will continue to be imported into Quebec and the Atlantic Provinces because of the high cost of overland rail shipment from Saskatchewan.

Eastern Canadian capacity to produce nitrogenous and phosphatic fertilizer materials is increasing rapidly. In 1963, Canada imported superphosphates having a value of \$3.7 million compared with imports valued at \$6.1 million only three years earlier in 1960. Exports of superphosphates in 1963 almost equalled imports whereas in 1960 exports were only \$100,000.

As the plants for which plans have been announced and those under construction come into production, Canadian imports of superphosphates and other phosphatic materials will decline. At the same time exports of nitrogenous and phosphatic materials, particularly to the U.S.A., should increase. Because Canada has no economic domestic source of phosphate rock, imports of this material will probably increase sharply. In 1964 imports of phosphate rock were valued at \$11.7 million, 42 per cent of the total value of imports of fertilizer materials and 57 per cent more than was imported in 1959, five years previously. By far the largest use of the imported phosphate rock is in the manufacture of fertilizers.

Tariff Considerations

Fertilizer materials and mixed fertilizers are entered under a number of tariff items, one of which, item 662, is in part, specific for particular materials regardless of their use, while another, item 663b, refers to articles and materials which enter into the cost of the manufacture of fertilizers; the third, item 663, provides for compounded or manufactured fertilizers, n.o.p. The three tariff items are given below, together with drawback item 1046 which relates to item 663b.

<u>Item 662</u>	<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
Fertilizers, unmanufactured, including phosphate rock, kainite or German potash salts and German mineral potash; bone dust, charred bone and bone ash; fish offal or refuse and animal or vegetable manures.....	Free	Free
<u>Item 663</u>		
Fertilizers, compounded or manufactured, n.o.p.	Free	5 p.c.

<u>Item 663b</u>	<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
Articles which enter into the cost of the manufacture of fertilizers, when imported for use exclusively in the manufacture of fertilizers.....	Free	Free

Drawback Item 1046Portion of Duty
Payable as Drawback

Materials. When used in the manufacture of articles entitled to entry under tariff item 663b when such articles are sold to manufacturers to be used as specified in said item.....	99 p.c.
---	---------

The discussion which follows deals with fertilizer materials and fertilizers. This is followed by a note on other articles and materials which are covered by item 663b and drawback item 1046.

In addition to the items reproduced above several others apply to particular fertilizer materials when they are used for purposes other than for direct application to the soil or in the manufacture of fertilizers. These are discussed in the sections of the report which deal with the specific products. In the following tabulation some of the major fertilizer materials are shown with the appropriate B.T.N. classification and the principal tariff items which would probably apply if the materials were not imported under items 662, 663 or 663b, or if these items were deleted from the Tariff.

<u>Product and B.T.N. Heading</u>		<u>Tariff Item Which Otherwise Would Probably Apply</u>		
		<u>Item</u>	<u>B.P.</u>	<u>M.F.N.</u>
Ammonium sulphate	31.02	208	Free	Free
Ammonium nitrate	31.02	208j	Free	25 p.c.
	31.02	208i	Free	10 p.c.
Nitrogen solutions	31.02	220a(i)	15 p.c.	20 p.c.
Sodium nitrate	31.02	210e	Free	Free
Calcium cyanamide	31.02	663a	Free	Free
Urea (partly)	31.02	711	15 p.c.	20 p.c.
Superphosphates	31.03	218	Free	25 p.c.
Potassium chloride, crude	31.04	209	Free	Free
refined	31.04	209e	Free	Free
Ammonium phosphates	31.05	218	Free	25 p.c.
Ammonium nitrate phosphate	31.05	220a(i)	15 p.c.	20 p.c.
Mixtures of fertilizers of 31.02, 31.03 and 31.04	31.05	220a(i)	15 p.c.	20 p.c.
Phosphate rock	25.10	711	15 p.c.	20 p.c.

The foregoing tariff items apply to the materials only when they are not used either for application to the soil or for the manufacture of fertilizers, the effective items are the fertilizer items, 662, 663 and 663b. Tariff items 662 and 663 apply to most fertilizer materials which are used for application to the soil and item 663b applies to all materials used for the manufacture of fertilizers. The information made available to the Board indicates that item 663 is administered specifically for fertilizer use, whereas item 662 applies to the materials more generally. As a result urea is classified under item 663 at rates of Free, B.P. and 5 p.c., M.F.N., only if it is to be used for application to the soil, but under item 711, at rates of 15 p.c., B.P. and 20 p.c., M.F.N., if it is to be used for other purposes. On the other hand, phosphate rock may be entered under item 662, free of duty under all Tariffs, regardless of the use to which it is put.

The Brussels Tariff Nomenclature deals specifically with fertilizers in Chapter 31 under headings 31.01, 31.02, 31.03, 31.04 and 31.05. These headings are reproduced below.

- 31.01 -- Guano and other natural animal or vegetable fertilisers, whether or not mixed together, but not chemically treated.
- 31.02 -- Mineral or chemical fertilisers, nitrogenous.
- 31.03 -- Mineral or chemical fertilisers, phosphatic.
- 31.04 -- Mineral or chemical fertilisers, potassic.
- 31.05 -- Other fertilisers; goods of the present chapter in tablets, lozenges and similar prepared forms or in packings of a gross weight not exceeding ten kilogrammes [22.046 lbs.].

The Explanatory Notes to the Brussels Nomenclature specify to what products each of the headings applies. The Notes which relate to headings 31.02, 31.03 and 31.04 state:

"This heading is to be taken to apply, and to apply only, to the following goods, provided that they are not put up in the forms or packings described in heading 31.05: ..." (1)

Because B.T.N. headings 31.01-.04 are specific regarding both inclusions and exclusions of products while items 662, 663 and 663b of the Canadian Customs Tariff are very general, Chapter 31 of the B.T.N. excludes many products which either now or in the future might be classified under items 662, 663 and 663b. Some of the specific problems are discussed under the individual headings of this Chapter of the B.T.N.

Another important difference between the two systems of classification is that under the B.T.N. the classification of a product in Chapter 31 is not dependent on how it is to be used. For example, the Explanatory Notes for heading 31.02, nitrogenous fertilizers, list the products which are classified under the heading and then state

(1) Explanatory Notes to the Brussels Nomenclature 1955, Third Impression, January 1964, p. 305

"It should be noted that the mineral or chemical products described above are classified in this heading even when they are clearly not to be used as fertilisers. On the other hand, the heading does not include nitrogenous products (such as ammonium chloride, heading 28.30) not described above, even if used as fertilisers."⁽¹⁾

Similar notes accompany headings 31.03, phosphatic, and heading 31.04, potassic fertilisers.

Thus the B.T.N. classification of fertilizers in Chapter 31 differs from that of the Canadian Customs Tariff in two major respects. Firstly, the B.T.N. generally specifies each of the products or concentrations of a product that would be classified as a fertilizer; the Canadian Tariff uses general terms such as "fertilizers" or "materials". Secondly, products which are classified in Chapter 31 are so classified regardless of the use to which they are put; in the administration of the Canadian Tariff, products which are classified under items 663 and 663b must be used as fertilizers or for their manufacture. Problems relating to the classification of specific products are dealt with under the appropriate headings that follow.

The Proposals

At the public hearing on fertilizers, in May, 1962, and at other hearings which dealt with some of the individual fertilizer materials, a variety of proposals were placed before the Board. The proposals which were made at hearings on specific products are dealt with in the sections of the report which relate to those products, mainly headings 31.01 to 31.05 inclusive. For some fertilizer materials, including some of substantial economic importance such as potassium magnesium sulphate, no representations were made to the Board. For these products the proposals relating to fertilizers in general would apply. The discussion which follows deals mainly with the representations which were made regarding fertilizers in general.

The Industry Committee proposed that the Brussels Tariff Nomenclature should be used to classify fertilizers.⁽²⁾ The Committee submitted a suggested format for a tariff schedule based on the B.T.N. but emphasized that this should be regarded only as an illustration of how the B.T.N. could be modified to suit various circumstances and should not be regarded as a proposed format for a tariff schedule.⁽³⁾

Central Spraying Equipment proposed that all "straight materials" be entered free of duty.⁽⁴⁾ The company did not specify what was intended by the term, but spokesmen for the Industry Committee and the Canadian Fertilizer Association suggested that "straight materials" would be single chemical compounds as opposed to mixed fertilizers.

(1) Explanatory Notes to the Brussels Nomenclature 1955, Third Impression, January 1964, p. 306

(2) Transcript, Vol. 81, p. 12311 and following

(3) Same, Vol. 81, p. 13327

(4) Same, Vol. 81, p. 12364

The Canadian Fertilizer Association, which claimed to represent the bulk of Canadian mixed fertilizer production and sales, recommended that end-use tariff item 663b and drawback item 1046 be deleted and be replaced by the following:

"1. Goods which enter into the cost of the manufacture of fertilizer, when imported for use exclusively in the manufacture of fertilizers.

"2. Goods: when used in the manufacture of goods entitled to entry under tariff item (1) when such goods are sold to manufacturers to be used as specified in that item." (1)

The principal difference in the wording of the existing and the suggested items is that the word "articles" in item 663b and the words "materials" and "articles" in item 1046 have been replaced by the word "goods". Another difference is that the proposal contained in the original submission was amended during the hearing so that the item proposed to replace drawback item 1046 would not be a drawback item. The spokesman for the Association recommended that the existing rates for item 663b should relate to item (1) and that there should be free entry under all Tariffs under item (2). (2)

The spokesman for the Association also urged that item 663 be deleted and be replaced by an item worded as follows:

"materials for use as fertilizers in condition as imported."

He proposed rates of Free, B.P. and 5 p.c., M.F.N., for this item, the existing rates under tariff item 663. (3)

Although the Association made no recommendations respecting tariff item 662 (unmanufactured fertilizers) or item 663a (cyanamide), its spokesman felt that the proposed replacement of item 663 would make retention of these items unnecessary.

The effect of the Association's proposal for the new item which would replace existing item 663 would increase the rates on unmanufactured fertilizers which are imported under tariff item 662 and for cyanamide which is now entered under item 663a, from free entry under all Tariffs to Free, B.P. and 5 p.c., M.F.N. The proposal would also make the new item an end-use item whereas items 662 and 663a are not now administered as such.

Cyanamid of Canada Limited informed the Board that it supported the brief of the Canadian Fertilizer Association. (4)

The Consolidated Mining and Smelting Company of Canada Limited (Cominco) proposed that tariff items 663, 663b and drawback item 1046 should be left unchanged with respect to their wording. The spokesman for the company also said that it would be

(1) Transcript, Vol. 81, p. 12374, 12424

(2) Same, Vol. 81, p. 12374, 12424-5

(3) Same, Vol. 81, p. 12376, 12419

(4) Same, Vol. 81, p. 12463

"in Canada's interest to maintain free entry of its fertilizers into the United States by dropping the 5% duty levied on imports into Canada [under item 663]."(1)

He recommended that the existing free entry under item 663b and the drawback of 99 p.c. under drawback item 1046 be maintained.

Sherritt Gordon Mines Limited proposed that urea should be entered free of duty under all Tariffs regardless of its grade or nitrogen content. The spokesman for the company also indicated his support for the proposals of the Canadian Fertilizer Association regarding the substitution of the word "goods" for the words "articles" and "materials" in the proposed items to replace tariff item 663b and drawback item 1046.(2)

Urea is now entered under tariff items 663 and 663b if imported for use as a fertilizer or for the manufacture of fertilizers and under item 711 if imported for other purposes. Thus the proposal of Sherritt Gordon would decrease the rates for urea for non-fertilizer uses, from 15 p.c., B.P. and 20 p.c., M.F.N., to free entry under both Tariffs.

The National Farmers Union indicated its opposition to any proposals which would have the effect of increasing the rates of duty on fertilizers and related end-use tariff items. Its spokesman said he recognized the need for revising the nomenclature but said that this should be not taken as an opportunity to raise the rates of duty on chemicals.(3)

The Electric Reduction Company of Canada (Erco) expressed an interest in phosphate rock which the company imports under tariff item 662. Erco proposed that the existing free entry for phosphate rock be continued. The spokesman for the company referred to previous submissions in which Erco had recommended the adoption of the Brussels Tariff Nomenclature and urged that phosphate rock be classified under an item worded like heading 25.10 of the B.T.N.(4) Heading 25.10 is worded as follows:

"Natural calcium phosphates, natural aluminium calcium phosphates, apatite and phosphatic chalk."

If the wording of heading 25.10 were adopted for a tariff item and phosphate rock were deleted from item 662, the phosphate rock which is now entered under item 662 would be classified under the new item. However, heading 25.10 includes some products which are not entered under item 662.

Erco also expressed an interest in phosphatic fertilizers of heading 31.03, including single superphosphate, triple superphosphate and phosphatic fertilizer solutions. The company recommended that these products be classified under a new item worded like heading 31.03

(1) Transcript, Vol. 81, p. 12474, 12476

(2) Same, Vol. 82, p. 12506

(3) Same, Vol. 82, p. 12555

(4) Same, Vol. 83, p. 12737

of the B.T.N. and bearing the rates which now apply to tariff item 663, namely, Free, B.P. and 5 p.c., M.F.N.⁽¹⁾

This proposal would involve no change in the existing rates of duty for these products when they are used as fertilizers or for the production of fertilizers. However, if superphosphates were entered for some other use they would probably be classified under tariff item 218, "acid phosphate not medicinal", with rates of Free, B.P. and 25 p.c., M.F.N.; no other use is known for superphosphates at present. Because the B.T.N. makes no provision for end-use treatment for superphosphates, under heading 31.03, this would involve a reduction in the M.F.N. rate for the products if entered for any uses other than those specified in items 663 and 663b.

The spokesman for Erco also expressed an interest in tariff item 663b. He said the company imports the phosphate rock which it uses at its Port Maitland, Ontario, plants under this item. He proposed that the existing rates under item 663b, free entry under all Tariffs, should be continued.⁽²⁾

The Aluminum Company of Canada Limited (Alcan) expressed an interest in "magnesia" which, in the B.T.N., is classified under heading 28.18, "oxides, hydroxides and peroxides, of strontium, barium or magnesium" and under heading 25.19 which relates to magnesite, a mineral form of magnesium oxide. In the Canadian Customs Tariff, magnesia is classified under item 663b, if for use in the manufacture of fertilizers, and under item 296b(1) for any other use. The rates under item 296b(1) are 15 p.c., B.P. and 15 p.c., M.F.N. The company proposed

"that the revised Canadian Tariff on fertilizers and related goods should make provision for magnesium bearing materials without setting limits on the percentages of contained plant foods so long as the materials are to be incorporated into fertilizers or used as fertilizers. It further submits that it is in Canada's interests to assure the free entry of fertilizers and fertilizer ingredients into the United States by providing in the Canadian Tariff for duty free entry of such materials."⁽³⁾

If an end-use item with provisions for free entry under all Tariffs were adopted to provide for magnesia that was used as a fertilizer or for the manufacture of fertilizers, it would take precedence over item 296b(1) for that use. As a result magnesia that was imported for use directly as a fertilizer would be entered free of duty instead of being dutiable, as it might under the existing Tariff, at rates of 15 p.c., B.P. and 15 p.c., M.F.N. For use in the manufacture of fertilizers the rates would be unchanged.

The Canadian Federation of Agriculture proposed

(1) Transcript, Vol. 83, p. 12762
 (2) Same, Vol. 83, p. 12781
 (3) Same, Vol. 83, p. 12792

"that the present duty-free entry provisions of the tariff respecting fertilizers and related goods, as provided under tariff items 662, 663(a), 663(b) and Drawback item 1046, be maintained in full effect. Its position with respect to item 663 is that there should not in any event be an increase in import duties under this item."(1)

The spokesman for the Federation pointed out that the provisions particularly of tariff item 663b and drawback item 1046 involve goods other than fertilizers and said "It is important to ensure that the full duty-free imports of articles and materials provided in these items are retained."

He also referred to the changes in wording which had been suggested by others and the proposed use of the B.T.N. for new tariff classifications. In this connection, he said:

"The position of the Canadian Federation of Agriculture is not that the precise wording in the present tariff must be retained but, rather, that the status quo should be retained -- that is the administrative position which now exists under this wording as it is understood by the Department."(2)

The Federation also supported the position of Alcan with regard to that company's submission for magnesia.

No other submissions were made to the Board relating to fertilizers in general. However, as mentioned previously, other proposals were made to the Board relating to individual products; these are discussed in the sections which deal with those products.

Analysis of the Rate Proposals

Those who appeared before the Board were generally agreed that the rates on fertilizers and on materials for the manufacture of fertilizers under the existing Tariff should not be increased. Some, for example the Aluminum Company of Canada (for magnesia) and Sherritt Gordon (for urea) requested lower rates for particular fertilizer materials; there were no objections to these requests. The proposals for magnesia (heading 28.18) and urea (heading 29.25) are discussed in the sections dealing with those headings.

In effect the proposed general changes involved only the rates under tariff item 663, manufactured fertilizers. Some recommended maintenance of the existing rates of Free, B.P. and 5 p.c., M.F.N.; others urged that the M.F.N. rate be reduced from 5 p.c. to free entry. Some, including the two farm groups, took a neutral position.

Those who supported retention of the 5 p.c., M.F.N. duty on manufactured or compounded fertilizers took the position that a large part of the Canadian market is vulnerable to competition from the U.S.A. and that the 5 p.c. protection would be useful particularly if

(1) Transcript, Vol. 83, p. 12813-4

(2) Same, Vol. 83, p. 12815

prices in the U.S.A. declined. Those who urged that entry should be free of duty said that the 5 p.c. duty offered little or no protection. They took the position that if the rate was reduced, countries to which Canada exported large quantities of fertilizers would have less reason for any increase in their duties on these materials.

In 1964 Canada's exports of fertilizers were valued at \$87 million and imports at \$28 million, the export surplus amounting to \$59 million. Apart from imports under item 663b, the products of this trade, if imported into Canada, would be classified as manufactured fertilizers, dutiable at 5 p.c., M.F.N. About 90 per cent of the exports were to the U.S.A. and most of the products were entered into that country free of duty. Moreover, such exports are entered into the U.S.A. free of duty, if of fertilizer grade, even when the products are not for use as fertilizers.

Most fertilizer products have a relatively low average value per ton. A large proportion of the total commercial trade in fertilizers and fertilizer materials would be valued at less than \$50 a ton. A duty of 5 p.c. on a product such as ammonium sulphate would amount to only \$1.65 a ton; on a more expensive material, for example, ammonium nitrate, the duty would be \$3.50 a ton.

From the tabulation of fertilizer freight rates which was presented earlier, it is evident that freight costs are likely to constitute a much greater impediment to international movements than a duty of 5 p.c. In fact, the spokesman for the Canadian Fertilizer Association informed the Board that the location of fertilizer plants is determined to a considerable extent by the magnitude of the local demand and the consideration of costs of shipping products with a relatively low concentration of active constituents. Moreover, in any location where the imported supply did have a freight advantage, the rate of duty of 5 p.c. would seldom be enough to alter the pattern of trade.

Analysis of the Classification Proposals

During the four days of the hearing, the discussions were concerned to a large extent with problems of wording the tariff items and with the effect of using the B.T.N. in place of the existing fertilizer items. Apart from classification proposals which would apply to specific products, two recommendations were made to the Board. One was that the existing tariff items 662, 663 and 663b be amended by essentially minor changes. The other recommendation involved the adoption of the Brussels Tariff Nomenclature, with certain amendments, to replace the existing items relating to fertilizers.

The proposal of the Canadian Fertilizer Association regarding the substitution of the word "goods" for the word "articles" in item 663b, was acceptable to most parties. The intention was to ensure that materials as well as other articles were properly covered by the item. There was also no objection to the recommendation of the Association that a new item be introduced which would replace existing item 663 and which would probably make tariff items 662 and 663a redundant.

If the proposed new item, "materials for use as fertilizers in condition as imported" resulted in the deletion of existing items 662 and 663a, the M.F.N. rate for the materials now entered under items 662, and cyanamide, entered under item 663a, would be increased from

free to 5 p.c. However, there would be a serious effect on the rates of duty for phosphate rock which has an important use in the manufacture of phosphorus and phosphoric acid, other than for fertilizers, and for cyanamide if imported for other than fertilizer use.

Phosphate rock regardless of use can be entered duty-free under item 662 except that when it is for the manufacture of fertilizers, it may enter, also duty-free, under item 663b. If special provision were not made for phosphate rock when imported for uses other than fertilizers, it would be entered under tariff item 711 at rates of 15 p.c., B.P. and 20 p.c., M.F.N. A similar situation would arise for cyanamide if imported for use other than as a fertilizer. It too would become dutiable under item 711 at 15 p.c., B.P. and 20 p.c., M.F.N., if for non-fertilizer use.

The other materials named in item 662 would also be affected, though their commercial importance is thought to be slight.

Much of the discussion at the hearing on fertilizers centered on the proposed adoption of the Brussels Tariff Nomenclature. In general there was little opposition to the proposal. However, many parties expressed their concern lest the adoption of the B.T.N. might, perhaps inadvertently, result in the scope of the existing items being restricted, with a resultant increase in the rates of duty for some materials now entered free or at low rates of duty.

The Industry Committee took the position that if the B.T.N. system of classification were used to revise the tariff items relating to chemicals, it would be desirable to retain the B.T.N. system as intact as possible. The question of the use of the Brussels Tariff Nomenclature is discussed in detail in a separate section of the report.

Tariff Item 663b and Drawback Item 1046, As Related to Goods Other Than Fertilizers

The preceding discussion dealt with tariff item 663b mainly as it pertains to fertilizer materials. However, item 663b and associated drawback item 1046 relate to a large variety of "articles" and "materials" other than fertilizers, for example, machinery, equipment and packaging materials.

At the public hearing in May 1962, the Canadian Fertilizer Association proposed that the word "articles" in item 663b and the words "materials" and "articles" in drawback item 1046 be replaced by the word "goods". The Association also urged that drawback item 1046 be reworded so that it would be an end-use item with free entry under all Tariffs instead of being a drawback item as at present.⁽¹⁾

The Canadian Federation of Agriculture and Cyanamid of Canada Limited supported the position of the Fertilizer Association.⁽²⁾

⁽¹⁾ Transcript, Vol. 81, p. 12374, 12424-5

⁽²⁾ Same, Vol. 81, p. 12441, 12463; Vol. 83, p. 12814

Consolidated Mining and Smelting Company of Canada Limited urged retention of tariff item 663b and drawback item 1046.(1)

The National Farmers Union supported the retention of the existing items.(2)

John Inglis Company Limited opposed the retention of item 663b and drawback item 1046 in so far as they relate to machinery and equipment. The company proposed that the wording of tariff item 663b be changed from "articles which enter into the cost of manufacture..." to "materials which enter into the cost of manufacture..."(3) The spokesman for John Inglis indicated that the intention of the change was that machinery and equipment would be excluded from item 663b and also, therefore, from drawback item 1046.

Later in the hearing the company spokesman said

"it is the submission of our company that machinery and equipment should not be permitted to enter Canada free of duty under tariff item 663b unless the end product is described exclusively as fertilizer, known as fertilizer, packaged and sold as fertilizer, and intended for use by the ultimate consumer only as fertilizer."(4)

He explained his position, saying

"The way it was intended I hoped that 663b would be changed by altering the word 'articles' to 'materials'. Secondly; if 663b remains in the tariff as it is, then the administration should be altered to permit machinery and equipment only for the manufacture of fertilizers."(5)

He further added:

"The items in which we are interested are ... boilers, and they enter Canada under 428c; ... pressure vessels, which come into Canada under 446a ... heat exchangers which would also be 446a, and ... tanks, which would be 446a."(6)

The existing rates under item 428c are 15 p.c., B.P. and 20 p.c., M.F.N. and under item 446a, 10 p.c., B.P. and 22½ p.c., M.F.N. If machinery and equipment now entered free of duty under tariff item 663b were excluded from that item some of these articles would become dutiable at the rates under items 428c and 446a. Thus, the articles mentioned by the spokesman for John Inglis, and probably many others, would become dutiable at much higher rates if the scope of tariff item 663b and, therefore, also of drawback item 1046, were limited as the company proposed.

(1) Transcript, Vol. 81, p. 12474

(2) Same, Vol. 82, p. 12537

(3) Same, Vol. 84, p. 12833

(4) Same, Vol. 84, p. 12843

(5) Same, Vol. 84, p. 12848

(6) Same, Vol. 84, p. 12853

John Inglis Company Limited took the position that end-use items and therefore tariff item 663b deprived Canadian manufacturers of some potential market for their goods by permitting entry free of duty or at low rates. The company spokesman said, "The effect of such 'end-use' items in the Canadian tariff structure has had much to do with the fact that the machinery and equipment industry in Canada has not developed to the extent that it has in the United States..."(1) He also said that foreign owners of plants located in Canada have a preference for their known suppliers in their home countries and tend to purchase from them.

Canadian Industries Limited (C.I.L.) informed the Board that at the coming hearing on plastics the company would propose the exclusion of polyethylene bags from tariff item 663b and the imposition of duties of not less than 15 p.c., B.P. and 20 p.c., M.F.N.(2)

At the hearing in April, 1963, C.I.L. proposed that polyethylene bags be dutiable at 30 p.c., M.F.N. The company did not make any recommendation regarding the B.P. rate of duty.(3) Polyethylene bags are entered under tariff item 908 (apart from end-use items) at rates of 15 p.c., B.P. and 20 p.c., M.F.N. Thus the exclusion of polyethylene bags from tariff item 663b would appear to involve substantial increases in the rates of duty for the bags when used for packaging fertilizer.

The spokesman for the Industry Committee said that three Canadian producers of polyethylene, Dow Corning Canada Limited, Du Pont Canada Limited and Union Carbide Canada Limited felt that "tariff item 663b does not in its present wording provide for polyethylene bags for packaging fertilizers."

He continued, saying,

"They respectfully suggest polyethylene bags, when used for packaging fertilizers, be excluded from the provisions of 663b, or its successor item ... They will be prepared to submit complete details relevant to polyethylene resins and resin products, at the time the Board is hearing representations for tariff rates on synthetic resins and resin products."(4)

Polyethylene is classified under heading 39.02 of the Brussels Tariff Nomenclature and articles of polyethylene are under heading 39.07. The representations regarding duties for polyethylene bags are dealt with in more detail in the section of the report relating to heading 39.07.

As the foregoing indicates, three proposals were placed before the Board. The first was that tariff item 663b should be retained essentially in its existing form, and that drawback item 1046, with a minor modification of wording, should become an end-use item.

(1) Transcript, Vol. 84, p. 12841

(2) Same, Vol. 84, p. 12907

(3) Same, Vol. 147, p. 21868

(4) Same, Vol. 84, p. 12908-9

The fertilizer manufacturers and the two farm organizations supported this position. The second proposal, by John Inglis Company, was that machinery or equipment should be excluded from item 663b and, therefore, also from drawback item 1046. The third proposal, by C.I.L., was that polyethylene bags should be excluded from item 663b, and the company's subsequent proposal would result in these becoming dutiable at 30 p.c., M.F.N.

Those who opposed limitations on the existing items or any changes in their essentially duty-free status for articles and materials, based their opposition largely on the effects of higher rates of duty on their costs. The manufacturers of fertilizers emphasized that a large part of their market was outside of Canada, particularly in the U.S.A. They said that if they were to continue to compete successfully with foreign manufacturers, they had to be able to purchase their machinery and equipment at prices comparable with those paid for these items by foreign producers.

The farm organizations opposed changes in the administration of the relevant items, or in their effective rates of duty because of the anticipation of higher costs for fertilizers if the recommendations of the John Inglis Company were adopted. The farm groups' spokesmen said that the industry faced keen competition both domestically and abroad and would find it difficult to absorb any additional costs arising out of higher costs of fertilizers.

The spokesman for the Aluminum Company of Canada Limited drew attention to the fact that John Inglis could take advantage of drawback item 1046 when the company manufactured goods for use in the manufacture of fertilizers. He said this should allow the company to meet foreign competition in selling fertilizer manufacturing equipment to Canadian fertilizer producers.

Although there were several general comments on the degree to which the existence of tariff item 663b was a handicap to Canadian manufacturers of machinery and equipment and the degree to which it benefitted Canadian fertilizer manufacturers, there was general agreement that there was insufficient information to allow these effects to be measured. The spokesman for John Inglis, in the following exchange during the questioning, suggested that the detrimental effect on his company was not serious.

Q.: "Where, in the battle for survival these rival industries draw blood, it is always interesting to know how much blood has been drawn from each?"

A.: [the spokesman for John Inglis]: I wouldn't say that we have lost a bucket over 663b."(1)

Concerning drawback item 1046, the spokesman for the John Inglis company said that the existence of drawback items encouraged Canadian manufacturers to shop around and look abroad for materials instead of buying them in a protected home market. He said:

(1) Transcript, Vol. 84, p. 12895

"When you are competing in the manufacture of equipment against duty-free equipment from other countries [imported under end-use items] you, naturally, would employ every tactic available to you to cut your costs and if we could get steel from Pittsburgh and bring it into Canada and get a 99 per cent rebate of duty, and it was cheaper that way, we may be forced to do it to compete."(1)

The spokesman for the Canadian Fertilizer Association made the following comment on this statement:

"My clients, who benefit primarily from the existence of 663b, compete in this market as a matter of course and all the time on a duty-free basis ... My clients produce fertilizer materials which enter into Canada duty free. Surely, there is nothing unreasonable in their being able to shop around too because they have to compete on a duty-free basis ... but I say it is not putting them in any kind of a privileged position whatsoever or in any different position from that in which the John Inglis company would find itself with the benefits of 1046 and having to operate on a duty-free basis."(2)

GUANO AND OTHER NATURAL ANIMAL OR VEGETABLE FERTILIZERS, WHETHER OR NOT MIXED TOGETHER, BUT NOT CHEMICALLY TREATED -- B.T.N. 31.01

Heading 31.01 of the Brussels Tariff Nomenclature provides for natural animal or vegetable fertilizers such as excreta, dung and rotted vegetable products unsuitable for use other than as fertilizers. The heading excludes products such as dried animal blood (Chapter 5), flours and meals of offals and fish, unfit for human consumption (heading 23.01), ash from bone, wood or peat (heading 26.04), and wastes of leather (heading 41.09). The heading also excludes products which have been chemically treated or when put up in the forms or packings described in heading 31.05.(3)

Natural fertilizers are used extensively in Canada but most of the materials that are classified under heading 31.01 do not appear to be of significant commercial importance. The only available statistics regarding products of the heading relate to animal manures. Exports of animal manures were valued at \$14,077 in 1964, about the same as in 1963.

The products classified under heading 31.01 would probably be entered under tariff item 662, "fertilizers, unmanufactured ... animal or vegetable manures", free of duty under both the B.P. and M.F.N. Tariffs.

At the public hearing on fertilizers, in May, 1962, no representations were made to the Board regarding any products included in heading 31.01. However, in a letter to the Board, dated September 26,

(1) Transcript, Vol. 84, p. 12899-900

(2) Same, Vol. 84, p. 12900

(3) Explanatory Notes to the Brussels Nomenclature 1955, Vol. 1, Third Impression, January 1964, p. 305

1963, F. Manley and Sons Limited, of Don Mills, Ontario, proposed that "Milorganite", a fertilizer material made from sewage, be dutiable at not more than the existing rate of 5 p.c., M.F.N. under item 663 and preferably should be dutiable at a lower rate. No other submissions were made to the Board relating specifically to products of heading 31.01.

In its submission to the Board, F. Manley and Sons included information which indicated that Milorganite was produced without chemical treatment. This, in conjunction with other information given, indicated that it would be classified under heading 31.01 of the B.T.N.

In its brief, the company claimed that Milorganite is an unique product because of its granular form; because of the very large capital investment required, however, it was not likely to be produced in Canada in the near future. The product is much higher priced than Canadian-produced sewage products, about \$84.80 per ton compared with a Toronto product at \$17.50 a ton. In terms of contained nitrogen, Milorganite was about twice the price of the Toronto sewage product.

The company also drew attention to the cost of freight from Milwaukee, Wisconsin to points in Ontario, of about \$18 per ton and said "... it would seem as if this burden on the Canadian importer provides more protection ... than does an ordinary rate of customs duty."

Although some products of heading 31.01, like Milorganite, might be classified under tariff item 663, most would be entered under item 662. However, tariff item 662 also includes, by name, several other products in addition to natural fertilizers of heading 31.01.

Item 662 is worded as follows:

"fertilizers, unmanufactured, including phosphate rock, kainite or German potash salts and German mineral potash; bone dust, charred bone and bone ash; fish offal or refuse and animal or vegetable manures."

In the administration of tariff item 662, those products which are named in the item, for example, phosphate rock, bone ash and fish offal, are entered under it regardless of whether they are to be used as fertilizers. If item 662 were deleted and the B.T.N. classification for fertilizers were adopted, other provision would be necessary for the phosphate rock, bone dust, charred bone, bone ash, fish offal or refuse which are named in item 662 but which are not included either in Chapter 28 or 31 of the B.T.N.

Moreover, even if provision were made for products such as fish offal and bone dust, in a general end-use item for fertilizers, the products which are named in item 662 and excluded from Chapter 31 would fall under other items of the Canadian Customs Tariff, if they were used other than as fertilizers. For example, charred bone, if imported into Canada for some non-fertilizer application, would probably be classified under tariff item 711 at rates of 15 p.c., B.P. and 20 p.c., M.F.N.; item 239 provides duty-free entry for bone black and item 689 provides for animal charcoal for use in the refining of sugar, Free, B.P., 25 p.c., M.F.N. Under the existing Tariff, charred bone is entered free of duty from all countries under tariff item 662.

MINERAL OR CHEMICAL FERTILISERS, NITROGENOUS -- B.T.N. 31.02INTRODUCTION

Heading 31.02 of the Brussels Tariff Nomenclature includes the following products.

Sodium nitrate containing not more than 16.3 per cent by weight of nitrogen;

Ammonium nitrate, whatever the degree of purity;

Ammonium sulphonitrate, whatever the degree of purity;

Ammonium sulphate, whatever the degree of purity;

Calcium nitrate containing not more than 16 per cent by weight of nitrogen;

Calcium nitrate - magnesium nitrate, whatever the degree of purity;

Calcium cyanamide containing not more than 25 per cent by weight of nitrogen, whether or not treated with oil;

Urea containing not more than 45 per cent by weight of nitrogen.

The heading also includes fertilizers consisting of any of the above mixed together; fertilizers consisting of ammonium chloride or any of the above mixed with chalk, gypsum or other inorganic non-fertilizing substances; and liquid fertilizers consisting of ammonium nitrate (whether or not pure) or of urea containing not more than 45 per cent by weight of nitrogen, or of mixtures of those products, in an aqueous or liquid ammonia solution.

The single substances listed above are classified under the heading regardless of their intended use; the mixtures are classified under the heading only if of a kind used as fertilizers. Except that the urea used in liquid fertilizers must contain not more than 45 per cent of nitrogen, the other mixtures may contain the other constituents in any degree of purity, for example sodium nitrate containing 16.4 per cent of nitrogen.

The most important products of heading 31.02 are ammonium nitrate, ammonium sulphate, calcium cyanamide and urea. The first three of these are discussed separately in the sections which follow; urea is discussed in the section of the report dealing with B.T.N. heading 29.25.

The statistical data are incomplete and there are difficulties in trying to account for nitrogenous mixtures that would be classified under heading 31.02. However, the available data suggest that in 1962 the Canadian consumption of products of heading 31.02 for all purposes had a value of about \$15 million, including use as fertilizer of \$11 million. In that year imports of these products were valued at about one million dollars and exports at \$32.6 million.

The usual form of sodium nitrate sold in North America contains more than 16.3 per cent nitrogen and therefore the import figure given above excludes this chemical. The product is discussed in the section of the report for heading 28.39. The use of sodium nitrate as a fertilizer material is a small part of its total use in Canada. It is estimated that in 1962 its consumption as a fertilizer had a value

of only \$41,000 compared with total imports valued at \$921,000. Sodium nitrate is not produced in Canada.

The table that follows shows the value of imports and exports of the principal nitrogenous fertilizer materials. Most of the foreign trade in these materials is with the U.S.A., and, as noted in the table, some U.S. data have been used to show details which would otherwise not be available.

Imports and Exports of Selected Nitrogenous
Fertilizer Materials, 1962-64

	Imports			Exports		
	1962	1963	1964	1962	1963	1964
	- thousand dollars -					
Ammonium nitrate	* (a)	56 ^(a)	216 ^(a)	11,630	13,144	11,012
Ammonium sulphate	393	488	598	7,103 ^(a)	6,544 ^(a)	6,057 ^(a)
Calcium cyanamide	-	-	-	1,990 ^(a)	1,537 ^(a)	1,301 ^(a)
Nitrogen solutions	481 ^(a)	515 ^(a)	1,058	3,360 ^(a)	3,658 ^(a)	3,561 ^(a)
Urea	123 ^(b)	110 ^(a)	563	5,483 ^(a)	6,906 ^(a)	9,194 ^(a)
Other	70	4	-	3,077	3,727	1,463
Total	1,067	1,165	2,435	32,643	35,516	32,588

(a) U.S. data in \$U.S.

(b) By subtraction from the total taken from Canadian trade statistics

Source: D.B.S., Trade of Canada, Imports and Exports; U.S. Import and Export Statistics

It is apparent that Canadian exports of nitrogenous fertilizers are greatly in excess of imports. Moreover, Canadian productive capacity for nitrogenous fertilizers is being rapidly expanded and the excess of exports will probably increase in the next few years.

Exports have constituted the largest market outlet for nitrogenous fertilizers. However, the domestic use of nitrogenous materials has been increasing rapidly since 1960 in terms of contained nitrogen. Previous to 1960 the nitrogen contained in fertilizer which was exported was three to four times as much as that used domestically; in 1963-64, the nitrogen contained in domestic sales was almost as much as that in exported fertilizer. Both the exports and the domestic use of nitrogen are mainly in the form of single materials rather than as mixed fertilizers. As was discussed in the preceding general section for fertilizers, costs of transportation limit the distance that mixed fertilizers can be shipped economically.

Nitrogenous fertilizer materials are generally more expensive than either phosphatic or potassic materials. Urea, which is sold currently at about \$90 a ton, is approached in average value only by ammonium phosphate which is priced at about \$80 a ton. Ammonium phosphate also contains a relatively large amount of nitrogen. Triple superphosphate, a concentrated source of phosphorus pentoxide was sold, at the same time, at about \$50 a ton and potassium chloride, for agricultural use, at about \$24 a ton.

Nitrogen Contained in Fertilizers
Sold in Canada and Exported, Selected Years,
1954-55 to 1963-64

<u>Years Ended June 30</u>	<u>Domestic Sales</u>	<u>Exports</u>	<u>Total</u>
	'000 tons of contained nitrogen		
1954-55	43	179	222
1956-57	50	197	247
1959-60	68	216	284
1960-61	80	233	319
1961-62	98	220	318
1962-63	122	230	352
1963-64	166	192	358

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207

Three of the major products of heading 31.02, dealt with below, are ammonium nitrate, ammonium sulphate, and calcium cyanamide; notes on other products of heading 31.02 then follow. Urea is discussed with other products of heading 29.25.

AMMONIUM NITRATE

The Industry and the Market

Ammonium nitrate is one of the most important industrial chemicals produced in Canada; production in 1964 was well in excess of 500,000 tons and sales in that year are estimated at about 370,000 tons valued at approximately \$20 million. Large quantities of ammonium nitrate are used captively in the manufacture of fertilizers and explosives. More than one-half of the merchant sales in 1964 were for export, mainly to the U.S.A. Domestic sales for use as a fertilizer were more than 100,000 tons; sales for use in explosives, the only other important application in Canada, accounted for most of the remainder.

Ammonium nitrate is produced for sale, as such, by four companies which operate five plants. In addition, two companies, Canadian Industries Limited and Du Pont of Canada Limited, produce the chemical largely or entirely for captive use. The capacity of the C.I.L. plant at Beloeil, Quebec, was said to be for 35,000 tons annually; the capacity of Du Pont, at North Bay, Ontario was reported to be much less. The capacity of the known merchant-producers, as reported in 1961, is shown below; the details of the substantial expansion in capacity since then are not known precisely.

Production and sales of ammonium nitrate have been increasing at a rapid rate. In the three-year period, 1962 to 1964 estimated production by merchant-producers increased by about 20 per cent and in 1964 exceeded 500,000 tons. In the same period, it is estimated that domestic and export sales combined rose by about 15 per cent, from about 320,000 tons to 370,000 tons. These figures exclude the ammonium

nitrate content of other products such as ammonium nitrate phosphate, a widely used fertilizer material. In 1963-64, sales in Canada of ammonium nitrate phosphate for direct application to the soil contained about 32,000 tons of ammonium nitrate.

Ammonium Nitrate, Capacity of Merchant Producers, 1961

	Annual Capacity In Tons
Consolidated Mining and Smelting Co. of Can. Ltd., Trail, B.C.	117,000
Calgary, Alta.	73,000
Northwest Nitro Chemicals Ltd., Medicine Hat, Alta.	33,000
Cyanarid of Canada, Welland, Ont.	140,000
Brockville Chemicals Ltd., Maitland, Ont.	<u>50,000</u>
	413,000

Source: Transcript, Vol. 26, p. 3934, 3944

An important development in the use of ammonium nitrate occurred when the prilling process was introduced by Consolidated Mining and Smelting Company of Canada Limited. Untreated ammonium nitrate absorbs moisture readily and cakes solidly unless it is very carefully handled and stored. The prilling process, which involves coating globules of ammonium nitrate with a material such as diatomaceous earth (about three per cent by weight) allows the chemical to retain its free-flowing, granular characteristics in normal use. The composition of the additive varies and may constitute as little as one-half per cent of the total weight. The development of this process was a major factor in expanding the use of the product. In ordinary commercial practice, ammonium nitrate, whether for explosive or fertilizer use, would be prilled and coated.

Ammonium nitrate is a very rich and relatively cheap source of nitrogen. The usual fertilizer grade contains 33.5 per cent of nitrogen. As a fertilizer it may be applied by itself or it may be mixed with other chemicals. Its use in Canada in the unmixed form has more than doubled in the past five years, from 42,000 tons in the crop year 1959-60, to 98,000 tons in 1963-64. Its use in mixed fertilizers is relatively small, about 5,000 tons annually. However, as indicated above, large quantities are also used in the production of ammonium nitrate phosphate.

A relatively new but rapidly expanding use of ammonium nitrate is in the field of explosives. Ammonium nitrate when mixed with fuel oil in the appropriate proportions is an explosive which has been displacing nitro-glycerine dynamite types at a very rapid rate. The chemical is also used in the increasingly popular blasting slurries, adding further to its growing use in explosives. Canadian manufacturers informed the Board that about 8,000 tons were used in 1958 for explosives; it is estimated that in 1964 over 40,000 tons were used for the ammonium nitrate-fuel oil mixtures (AN/FO) which, by then, accounted

for about 34 per cent of all explosives consumed in Canada in that year. These mixtures, together with the blasting slurries, were expected to supply 70 per cent, or perhaps as much as 75 per cent, of total explosives requirements in a few years time. That proportion was thought to mark approximately their probable maximum penetration into the explosives field. By 1964 the total use of ammonium nitrate in explosives likely was of the order of 60,000 to 65,000 tons.

The regional distribution of the market for ammonium nitrate in explosives depends very largely upon current activity in those mining operations which use explosives extensively and in the distribution of construction projects such as dams, highways and sewers. These activities have their greatest impact in different places at different times, but in recent years mining operations in the Quebec-Labrador area, Northern Ontario, Manitoba and British Columbia have been important. The available information suggests, for example, that in some recent years as much as 15,000 tons annually, about one-third of the AN/FO explosive use, has been in the northern Quebec-Labrador area. The general presentation on the explosives industry is given in that part of the report dealing with Chapter 36 of the B.T.N.

A very pure form of ammonium nitrate is used to produce nitrous oxide. The annual consumption of this product was said to be about 500 tons in 1960. Ammonium nitrate is also used in the manufacture of other chemicals but this appears to account for only about 1,000 tons annually. These uses appear to be fairly steady and are not an anticipated source of increasing demand for ammonium nitrate.

In contrast, it seems likely that the use of ammonium nitrate as a fertilizer material will continue to increase rapidly, particularly in the Prairies. The use of ammonium nitrate as a fertilizer is largest in Ontario and Alberta. In the crop year 1963-64, Ontario accounted for 45 per cent of Canadian consumption for this purpose and Alberta for 35 per cent. Most of the remainder was consumed in the other Prairie Provinces and in British Columbia. In the past five years, 1959-60 to 1963-64, its utilization on the Prairies has more than trebled; in the same period its use in Ontario has approximately doubled.

Sales of Ammonium Nitrate, For Direct Use as Fertilizer,^(a)
Crop Years Ended June 30, 1957-64

Crop Year Ended June 30	Atlantic Provinces	Quebec	Ontario	Prairie Provinces	B.C.	Canada
			- tons -	-		
1957	1,169	759	16,203	5,723	2,665	26,519
1958	1,389	724	21,709	6,861	2,992	33,675
1959	1,600	1,008	22,546	9,815	3,325	38,294
1960	1,360	952	22,473	13,771	3,722	42,278
1961	1,290	1,306	26,887	18,062	3,578	51,123
1962	1,518	1,176	28,891	18,705	4,658	54,948
1963	1,540	1,407	37,164	29,189	5,124	74,424
1964	2,160	2,553	44,761	43,865	5,066	98,405

(a) Other than for manufacturing

Source: D.B.S., The Fertilizer Trade, Cat. No. 46-207

Foreign Trade

Imports are a negligible factor in the Canadian supply situation. In none of the past ten years have imports reached 1,000 tons, and in most recent years they have been less than 100 tons. Imports are almost entirely from the U.S.A.

Imports of Nitrate of Ammonia, by Country of Origin,
Selected Years, 1953-63

	<u>U.K.</u>	<u>U.S.A.</u>	<u>Other</u>	<u>Total</u>	
				tons	\$'000
1953	104	700	-	805	79.1
1955	-	830	-	830	94.5
1957	1	103	-	104	15.6
1959	1	25	-	26	4.1
1961	1	647	-	648	40.4
1962	-	75	-	75	5.1
1963	-	50	-	50	3.4

Source: D.B.S., Trade of Canada, Imports, s.c. 8261

In contrast, exports account for about one-half to two-thirds of sales by Canadian manufacturers. In 1963, Canadian exports of ammonium nitrate, mainly to the U.S.A., were valued at about \$13 million; the value of imports in 1963 was only \$3,400. Canadian export data for ammonium nitrate are available only for 1962, 1963 and 1964. In those three years exports to the U.S.A. were from 94 to 99 per cent of the total exported. Exports to countries other than the U.S.A. are increasing. In 1962 these were valued at \$65,000; in 1963 they had a value of \$250,000 and in 1964 they amounted to \$692,000. However, the U.S.A. is likely to remain by far the most important market for the Canadian-produced product.

Exports of Ammonium Nitrate, to the U.S.A.,
Selected Years, 1953-64; Total Exports, 1963-64

	<u>To the U.S.A.</u>			<u>Total Exports</u>	
	<u>tons</u>	<u>\$'000</u>	<u>\$ per ton</u> ^(a)	<u>tons</u>	<u>\$'000</u>
1953	254,181	17,082	67.20	..	..
1955	222,336	14,678	66.02	..	..
1957	202,070	11,940	59.09	..	..
1959	183,637	10,086	54.92	..	..
1961	159,814	9,056	56.66	..	..
1962	230,287	11,734	50.95	..	..
1963	252,105 ^(b)	12,894	51.15 ^(b)	257,000 ^(b)	13,144
1964	202,000 ^(b)	10,320	51.00 ^(b)	216,000 ^(b)	11,012

(a) 1953 to 1962 in U.S. dollars

(b) Estimated

Source: U.S. Imports of Merchandise for Consumption, FT-110, s.c. 8501200 and s.c. 8501400; D.B.S., Trade of Canada, Exports, s.c. 416-44

Although Canadian statistics did not show exports of ammonium nitrate separately until 1962, it is understood that almost all exports in earlier years were to the U.S.A. and the preceding table shows imports into the U.S.A. from Canada.

Pricing Policy

Ammonium nitrate is sold in Canada f.o.b. plant, freight equalized. A similar pricing policy is followed in the U.S.A. Because of the large volume of Canadian exports to the U.S.A., prices of the Canadian product are published regularly in U.S. trade publications. In recent years published prices of the U.S. and Canadian product have differed only occasionally. In both countries it is customary to allow a discount of up to \$5 a ton for fertilizer use to encourage buyers to take delivery in the off-season, during the fall and early winter.

Prices of Ammonium Nitrate, Fertilizer Grade, 33.5
Per Cent Nitrogen, in Bags, f.o.b. Plant, Freight Equalized,
in the Eastern U.S.A., Selected Years, 1953-64

	<u>U.S. Domestic</u>	<u>Imported Canadian</u>
	\$U.S. per ton	
1953	64 - 68	72.50 - 77.50
1955	68	70.00 - 74.50
1957	64 - 68	64 - 68
1959	63 - 68	63 - 68
1961	64 - 67	64 - 70
1962	70	70
1963	64 - 70	64 - 70
1964	70	70

Source: Oil, Paint and Drug Reporter

Transportation:

Ammonium nitrate is a hazardous material to transport and disastrous explosions have occurred. Precautionary shipping regulations are made that include, in some instances, load limits. For example, individual shipments of ammonium nitrate of only up to 10,000 short tons are permitted passage through the St. Lawrence Seaway and then,

"providing the material was packed in accordance with the requirements of the Dangerous Goods Shipping Regulations and subject to any special restrictions which might be imposed by the National Harbours Board and the Seaway Authority.

"It must be emphasized that this recommendation applies only to ... Ammonium Nitrate Fertilizer (Nitroprills and Aeroprills) manufactured in Canada or of identical composition, and which is packaged, handled and stowed in accordance with the Appendix to schedule 'K' of those regulations.

"A quantity restriction of 500 tons will still apply to all other types of ammonium nitrate."(1)

At the public hearing it was said that this circumstance was an advantage to Canadian producers, in that it made overseas competition in most of the Canadian market difficult. It should be noted that the regulations generally do not apply below Quebec City. Some Canadian producers said that if there were no duty on imports of ammonium nitrate when for use as an explosive, the important Quebec-Labrador mining area near Schefferville would be exposed to competition from continental Europe because ships could unload at Sept Iles without concern for the weight limitation that exists farther up the St. Lawrence. Except for this market, Canadian producers apparently have substantial freight advantages over potential foreign competition in most regions of the country.

Tariff Considerations

Ammonium nitrate, when it is not mixed with another substance for example, diatomaceous earth, is entered under item 208j and under end-use items 208i and 663b. The unmixed product would be classified under item 208j if for use as an explosive or for direct application to the soil as a fertilizer, and under item 663b if for manufacture of fertilizers.

<u>Item 208j</u>	<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
Nitrate of ammonia, n.o.p. and sal ammoniac ..	Free	25 p.c.
<u>Item 208i</u>		
Nitrate of ammonia, when imported for use in the manufacture of nitrous oxide.....	Free	10 p.c.
<u>Item 663b</u>		
Articles which enter into the cost of the manufacture of fertilizers, when imported for use exclusively in the manufacture of fertilizers.....	Free	Free

When ammonium nitrate is treated with another substance, to prevent caking, and is for use in the manufacture of fertilizers it is entered under item 663b. However, if in this form and for direct application as a fertilizer, it is entered under item 663, "Fertilizers, compounded or manufactured, n.o.p.", Free, B.P. and at 5 p.c., M.F.N.

If treated to prevent caking and imported for uses other than fertilizer, particularly explosives, ammonium nitrate is entered under item 220a(i), at 15 p.c., B.P. and 20 p.c., M.F.N.

(1) Letter to the Board, April 30, 1965, from The St. Lawrence Seaway Authority

The tariff items under which ammonium nitrate may be entered are tabulated below.

	Existing Tariff			Proposed Rate	
	Item	B.P.	M.F.N.	B.P.	M.F.N.
<u>Untreated</u>					
For manufacture of fertilizers	663b	Free	Free	Free	Free
For use as a fertilizer	208j	Free	25 p.c.	Free	5 p.c.
For use in explosives	208j	Free	25 p.c.	15 p.c.	20 p.c.
For manufacture of nitrous oxide	208i	Free	10 p.c.	15 p.c.	20 p.c.
For other uses(a)	208j	Free	25 p.c.	15 p.c.	20 p.c.
<u>Treated</u>					
For manufacture of fertilizers	663b	Free	Free	Free	Free
For use as a fertilizer	663	Free	5 p.c.	Free	5 p.c.
For use in explosives	220a(i)	15 p.c.	20 p.c.	15 p.c.	20 p.c.
For other uses(a)	220a(i)	15 p.c.	20 p.c.	15 p.c.	20 p.c.

(a) Except for the provisions of other end-use items

Because the great bulk of the product which enters commercial trade is prilled and treated to prevent solidification, the effective items are those that relate to the treated product. As indicated earlier, the use for fertilizers and explosives are the only ones of consequence; the quantities used in other applications represent less than one-half of one per cent of Canadian sales. Therefore, for all practical purposes, ammonium nitrate would be entered free of duty, under item 663b, if for manufacture of fertilizers; at 5 p.c., M.F.N. under item 663 for direct application as a fertilizer; or at 15 p.c., B.P. and 20 p.c., M.F.N., under item 220a(i), if for use in explosives.

In the B.T.N. ammonium nitrate is classified under heading 31.02, "whatever the degree of purity" and even when it is "clearly not to be used" as fertilizer.⁽¹⁾

At the public hearing in February 1961 and at later hearings, the Industry Committee proposed amendments to the B.T.N. whose principal effect under heading 31.02 was to permit differential tariff treatment for that ammonium nitrate intended for use in fertilizers or as a fertilizer and for that ammonium nitrate intended for any other use.⁽²⁾

Consolidated Mining and Smelting Company of Canada Limited (Cominco), a major producer and exporter, proposed that the existing free entry under item 663b be continued.⁽³⁾ The company made no proposal relative to the rates under item 208j.

(1) Explanatory Notes to the Brussels Nomenclature, 1955, Vol. 1, p. 306

(2) Transcript, Vol. 26, p. 3931; Vol. 81, p. 12312 and following

(3) Same, Vol. 26, p. 3935

Cyanamid of Canada Limited and Brockville Chemicals Limited proposed rates of 15 p.c., B.P. and 20 p.c., M.F.N., for ammonium nitrate when imported for use other than in fertilizers. The two companies emphasized that their proposal was aimed principally at potential imports for use as an explosive.⁽¹⁾

The Canadian Federation of Agriculture listed ammonium nitrate as a constituent of fertilizers and requested the continuation of the end-use provisions of item 663b, with free entry under all Tariffs, for chemicals used in the manufacture of fertilizers. The Federation also proposed that manufactured fertilizers which are imported for direct application to the soil should be dutiable at Free, B.P. and 5 p.c., M.F.N., the existing rates under item 663.

Thus the proposals placed before the Board were for rates of 15 p.c., B.P., 20 p.c., M.F.N. for ammonium nitrate imported for non-fertilizer applications, and for the continuation of the existing rates under items 663 and 663b for ammonium nitrate used as fertilizer or for the manufacture of fertilizers, if treated to prevent caking. Untreated ammonium nitrate when imported for direct use as a fertilizer would be free of duty, as if classified under item 662, instead of being dutiable as at present, under item 208j.

Cominco informed the Board that about 75 per cent of its output was sold in the U.S.A. in competition with that of United States producers who were usually more advantageously located relative to consumers. The spokesman for the company said the existence of the Canadian Tariff had not been a factor in the establishment of the company's plants. In other submissions Cominco took the position that rates of duty which would affect the costs of other Canadian manufacturers should not be increased, and that no changes should be made in the Canadian Tariff which might lead to retaliatory increases by other countries. The company also drew attention to the fact that high costs of overland transportation made it economically impossible for Cominco to market some of its products in the industrial areas of Ontario and Quebec, and therefore it was forced to rely on export markets for disposal of such products.⁽²⁾

Cyanamid and Brockville Chemicals emphasized that they were concerned with potential imports for explosives and other non-fertilizer uses. They said that they had no concern over possible competition from British preferential countries and, insofar as the fertilizer use was concerned, they were more advantageously located relative to the Canadian and a part of the U.S. market than were foreign producers. They expressed concern lest lower rates of duty should enable European producers to exploit the market in Labrador and Northern Quebec, by unloading their product at Sept Iles and so avoid the weight restriction which applies to Canadian shipments coming from west of Quebec City.

The market for ammonium nitrate in the Labrador-Northern Quebec region is estimated to have been, at times, 15,000 tons annually, perhaps a quarter of total explosives use in Canada, but less than four per cent of estimated total sales by Canadian producers. Although the nearest Canadian suppliers are situated at a considerable distance, it

(1) Transcript, Vol. 26, p. 3951

(2) Same, Vol. 5, p. 715-6

was not established that, if entry was free of duty, European countries such as Germany or the Netherlands could in fact compete successfully with the Canadian product in this region. Ammonium nitrate, if treated, can now be entered at 5 p.c., M.F.N. if for use as a fertilizer and there is a market for such a product in the Atlantic Provinces and in Eastern Quebec, but there have been no imports from continental Europe since 1954, when one ton was imported from France and 11 tons were imported from West Germany.

Cyanamid of Canada and Brockville Chemicals noted that individual sales for use in fertilizers were in small quantities and required a dealer organization for distribution, but that purchases for use in explosives by large mines were in bulk and therefore did not require such an organized sales effort. However, some of the companies which purchase ammonium nitrate to mix with other ingredients for the production of mixed fertilizers are large and would probably buy the product in bulk quantities.

AMMONIUM SULPHATE

Ammonium sulphate is produced by the reaction of ammonia with sulphuric acid. It is manufactured in Canada by about six companies, but only two, Consolidated Mining and Smelting Company of Canada Limited (Cominco) and Sherritt Gordon Mines Limited, produce it in large volume. In all instances it is produced either as a by-product, a co-product, or as a means of disposing of another chemical. Cominco produces ammonium sulphate partly as a means of disposing of sulphur dioxide which it must extract from its waste gases; Sherritt Gordon produces it as a co-product of its metal refining processes; and the other producers, mainly steel companies, manufacture it as a by-product of their operations.

Canadian production has been declining in recent years. In the crop year 1963-64, Canada produced about 282,000 tons, 20,000 tons less than in 1960 and 50,000 tons less than in 1958 and 1959. About 85 per cent of Canadian output is currently exported, mainly to the U.S.A. Total sales in Canada in crop year 1963-64 had an estimated value of just over \$2 million and exports were valued at about \$6 million. Current Canadian consumption is about 65,000 tons annually, of which only about 200 tons is known to be used other than as a fertilizer.

Production, Imports, Exports and Domestic Disappearance of Ammonium Sulphate, Crop Years Ended June 30, 1958-64

	<u>Production</u>	<u>Imports</u>	Estimated <u>Exports(a)</u>	<u>Sold in Canada</u>	
				<u>For Direct</u>	<u>For Mfr. of</u>
				<u>Application</u>	<u>Fertilizer</u>
	thousand tons			thousand tons	
1958	335	4	302	6	31
1959	332	9	301	7	32
1960	302	5	270	7	30
1961	306	8	265	10	39
1962	296	10	256	11	39
1963	269	14	226	14	43
1964	282	20	239	21	43 ^(b)

(a) Production plus imports minus sold in Canada

(b) Estimated

Source: D.B.S., The Fertilizer Trade, Cat. No. 46-207; Manufacturers of Mixed Fertilizers, Cat. No. 46-220; Canadian Chemical Processing

In Canada the principal use of ammonium sulphate is in the manufacture of mixed fertilizers; about two-thirds of the total consumption in 1964 was estimated to be for this purpose. Canadian use of ammonium sulphate has been increasing in recent years, principally because of the expanding consumption for direct application to the soil, although its use in mixed fertilizers also has been growing. In the crop year of 1959-60, about 6,600 tons out of a total used in Canada of about 37,000 tons was for direct application; in 1963-64, five years later, this application had more than trebled, to 21,000 tons out of a total use estimated at approximately 65,000 tons. In the past two years an estimated 43,000 tons annually has been used in the production of mixed fertilizers.

Most of the Canadian utilization for the manufacture of mixed fertilizers probably occurs east of Manitoba; it is here that much of the Canadian production of mixed fertilizer is located and into this area most imports are entered. For direct application to the soil, most of the consumption is west of Ontario, particularly in Alberta. In the crop year, 1963-64, Alberta consumed 78 per cent of the total for this purpose and B.C. about nine per cent. Only six per cent of the total applied directly was in provinces east of Manitoba.

The cost of freight makes it uneconomic for Western production to supply Eastern needs and as a result the two major producers export a large part of their output while Eastern requirements are supplied mainly by imports from the U.S.A. and European countries.

Ammonium Sulphate Fertilizer Sold for Direct Application and for the
Manufacture of Mixed Fertilizers, by Region, 1959-64

<u>Year</u> ^(a)	<u>East of Manitoba</u>	<u>Manitoba & Sask.</u>	<u>Alberta</u>	<u>British Columbia</u>	<u>Canada</u>	<u>Sold For Mixed Fertilizer</u>
			- tons -	-		
1959	2,311	224	2,933	1,766	7,234	32,216
1960	723	242	3,608	2,032	6,605	30,091
1961	783	369	6,905	1,968	10,025	38,551
1962	896	406	7,346	2,039	10,687	38,600
1963	1,270	581	10,238	2,120	14,209	43,100 ^(b)
1964	1,256	1,332	16,215	1,842	20,645	43,100 ^(c)

(a) Crop year ended June 30

(b) Canadian Chemical Processing

(c) Estimated by carrying forward the 1963 figure

Source: D.B.S., The Fertilizer Trade, Cat. No. 46-207; Manufacturers of Mixed Fertilizers, Cat. No. 46-220

Canadian exports of ammonium sulphate are currently valued at around six million dollars annually compared with imports of about \$600,000. Imports are almost exclusively into provinces east of Manitoba, with 80 to 85 per cent entering New Brunswick and Quebec. In 1962 less than one per cent of imports were entered in the West; in 1963 no imports were entered west of Ontario.

In recent years, imports have been increasing and were valued at about \$600,000 in 1964. In most years the United States is the principal supplier. However, in occasional years imports from West Germany, Italy, or Belgium and Luxembourg have exceeded those from the U.S.A.; Britain and Western Germany are the only European countries that have supplied the Canadian market regularly.

Imports and Exports of Ammonium Sulphate,
Selected Years, 1953-64

	<u>Imports</u>			<u>Exports</u>		
	<u>U.S.A.</u>	<u>Other</u>	<u>Total</u>	<u>U.S.A.</u>	<u>Other</u>	<u>Total</u>
	-	\$'000	-	-	\$'000	-
1953	223	703	926	6,493	*	6,493
1955	271	40	311	7,812	3,166	10,978
1957	101	29	130	4,869	4,431	9,300
1959	178	30	208	4,509	3,998	8,507
1961	112	194	306	4,998	2,419	7,417
1962	129	264	393	5,042	2,061	7,103
1963	153	335	488	4,563	1,981	6,544
1964	337	261	598	4,979	1,078	6,057

Source: D.B.S., Trade of Canada, Imports, s.c. 8151 and s.c. 416-48;
Trade of Canada, Exports, s.c. 8160 and s.c. 416-48

The value of exports has declined considerably in the past decade, from about \$12 million in 1956 to \$6 million in 1964, approximately the level of 1953. A change has also taken place in the destination of exports over this period. The largest part of Canada's exports has continued to go to the U.S.A. but, since 1955, Far Eastern countries have also provided an important market.

Exports of Ammonium Sulphate by Country of Destination
Selected Years, 1953-64

	<u>U.S.A.</u>	<u>Korea</u>	<u>Pakistan</u>	<u>India</u>	<u>Selected Other</u>	<u>Total</u>
			- thousand dollars -			
1953	6,493	-	-	-	-	6,493
1955	7,812	1,361	-	-	1,642 ^(a)	10,978
1957	4,869	1,405	-	1,724	1,211 ^(a)	9,300
1959	4,509	2,108	-	965	118 ^(a)	8,507
1961	4,998	1,128	1,272	-	-	7,417
1962	5,042	274	1,355	-	432 ^(b)	7,103
1963	4,563	-	1,981	-	-	6,544
1964	4,979	-	689	-	390 ^(b)	6,057

(a) China and the Phillipines

(b) Australia

Source: D.B.S., Trade of Canada, Exports, s.c. 8160 and s.c. 416-48

Ammonium sulphate is sold in various grades which differ considerably in price. In 1964, in the U.S.A., the standard, granular grade in bulk was \$32 a ton, f.o.b. works, and the technical grade in bulk was \$52 a ton. Prices are not published in Canada. At the time of the hearing, early in 1961, it was the practice of producers in the U.S.A. to quote prices, f.o.b. plant, but to absorb the first \$8 of incurred freight. The effect of this practice would be to make the f.o.b. plant price the delivered price in a large part, or most, of the U.S. market. The spokesman for Cominco said that his company did not quote prices f.o.b. plant; in order to sell the product in the U.S.A. the company simply delivered to customers at the same price as the closest competing plant.

Prices of Ammonium Sulphate in the U.S.A.,
1959-65

	Standard, Granular, <u>In Bulk</u>	Large, Granular, <u>In Bulk</u>	Technical <u>In Bulk</u>	Purified <u>In Bags</u>
	\$ per ton, f.o.b. works			
1959	32.00	35.00	52.00	170.00
1960	32.00 - 35.00	35.00	52.00	170.00
1961	32.00 - 35.00	35.00	52.00	170.00
1962	32.00	35.00	52.00	190.00
1963	28.00 - 30.00	35.00	52.00	190.00
1964	32.00	37.00	52.00	190.00
1965	32.00 - 34.00	37.00	52.00	190.00

Source: Oil, Paint and Drug Reporter

Transportation was said to be an important element in the cost of marketing Canadian-produced ammonium sulphate. The principal market for the product is in the U.S.A. and lesser amounts are sold in Asian markets. The two major Canadian producers are located a considerable distance from west coast ports, and were said to be located farther from U.S. points of consumption than competitive plants in the U.S.A.

Tariff Considerations

Ammonium sulphate is enumerated in item 208, free of duty under all Tariffs. It could be entered free of duty under item 663b as a material for use in the manufacture of fertilizers. At the public hearing, in February 1961, Consolidated Mining and Smelting Company of Canada Limited urged that free entry be continued.⁽¹⁾

The spokesman for Cominco stated that in view of the provisions for free entry of the product into Canada, it was apparent that tariffs have not been a factor in the establishment of the industry in

(1) Transcript, Vol. 25, p. 3737

Canada. In his presentation he emphasized the dependence of Canadian producers on export markets, particularly in the U.S.A. In other submissions by the company emphasis was also placed on the possibilities of retaliatory action if Canadian rates on imports were increased.

At a later hearing, the Canadian Federation of Agriculture (C.F.A.) proposed that the existing provisions for free entry of materials used in the manufacture of fertilizers be retained and that rates for manufactured materials used for direct application as fertilizers, Free, B.P. and 5 p.c., M.F.N., should not be increased.⁽¹⁾ The Federation listed ammonium sulphate as a material used in fertilizers.

The C.F.A. also listed ammonium sulphate as a material used in the manufacture of pesticides. It proposed that materials used in the manufacture of pesticides should be entered free of duty, as at present, "on the basis of the identification of these products by their end use."⁽²⁾

The Canadian Pharmaceutical Manufacturers Association listed ammonium sulphate as a relatively unimportant chemical used by its members. The Association proposed that chemicals made in Canada and used in the manufacture of pharmaceutical products be dutiable at the heading rates.⁽³⁾ In most instances, the proposed heading rates were 15 p.c., B.P. and 20 p.c., M.F.N. The spokesman for the Association gave no indication why such rates would be appropriate specifically for ammonium sulphate.

At the 1961 hearing the Industry Committee recommended that the product should be classified under heading 28.38, in anticipation of proposals regarding classification which it intended to present at a later date.⁽⁴⁾ At the hearing in May 1962 on fertilizers, the Committee recommended the Brussels classification for ammonium sulphate, in a tariff item worded like heading 31.02, but with suggested amendments which would permit differential treatment for the product when used for fertilizing the soil and for other uses.⁽⁵⁾

No other representations were made to the Board relating specifically to ammonium sulphate.

In the Brussels Tariff Nomenclature, ammonium sulphate is classified by heading 31.02 regardless of its purity or of its intended use. If packed in containers and having a gross weight not exceeding 10 kilogrammes (22.05 pounds) it is classified by heading 31.05. If the B.T.N. classification for chemicals were adopted, ammonium sulphate would be classified by headings 31.02 or 31.05, as indicated above.

As already noted, there was no controversy regarding the proposed rates of duty and Cominco's proposal for continued free entry for all purposes, as under tariff item 208, was not opposed. Canadian exports greatly exceed imports. It appears that imports occur mainly

(1) Transcript, Vol. 83, p. 12813-4

(2) Same, Vol. 110, p. 16632

(3) Same, Vol. 87, p. 13278

(4) Same, Vol. 25, p. 3622

(5) Same, Vol. 81, p. 12318 and following

because of the expensive overland haul that would be required to transport ammonium sulphate from British Columbia and Alberta, where most of it is produced, to provinces east of Manitoba, where most of the imports are entered.

CALCIUM CYANAMIDE

Calcium cyanamide (lime nitrogen, cyanamid) is produced by heating calcium carbide (heading 28.56) and forcing nitrogen into the mass. The product has been produced in Canada since 1907 by Cyanamid of Canada Limited, at Niagara Falls, Ontario. This is reported to be the only plant in North America which manufactures calcium cyanamide.

Calcium cyanamide was originally produced for use as a fertilizer because it is a rich source of nitrogen. However, it has been largely displaced as a fertilizer by other nitrogenous products such as ammonium nitrate, ammonium sulphate and urea. Currently, its principal use is in the production of dicyandiamide which is a raw material for the production of melamine plastics. The product is still used to some extent as a fertilizer and some is used as a defoliant spray for cotton plants. Small amounts are also used for pharmaceuticals and pesticides.

The spokesman for Cyanamid said that there had been a contraction of the market of from 10 to 15 per cent during the past five to ten years. He said that the capacity of the Cyanamid plant was about 300,000 tons annually and that production in 1960 was approximately 200,000 tons, most of which was used captively. Cyanamid indicated the following disposition of the product in 1960.⁽¹⁾

	<u>Tons</u>	<u>Estimated Value(a) \$'000</u>
Domestic sales	2,600	150
Export sales	44,000	2,550
Captive use	<u>153,400</u>	<u>8,900</u>
Total production	200,000	11,600

(a) Assumes average value of \$58 per ton

In 1960, about 1,500 tons of calcium cyanamide were used in Canada for direct application to the soil and about 600 tons were used for the manufacture of mixed fertilizers. Thus, in 1960, approximately 80 per cent of sales in Canada were for use as a fertilizer. However, it is apparent that domestic sales are unimportant relative to export sales and that captive use, for the manufacture of melamine plastics, is the most important application.

(1) Transcript, Vol. 34, p. 5042

There are no known imports of calcium cyanamide and the substantial exports are entirely to the U.S.A. Exports have declined in recent years from nearly 60,000 tons annually, in the late 1950's, to about half that amount annually in the early 1960's.

Imports of Calcium Cyanamide into the U.S.A.
from Canada, 1957-64

	tons	\$U.S. '000	\$U.S. per ton
1957	57,928	3,250	56.10
1958	57,334	3,185	55.54
1959	58,400	3,727	63.82
1960	44,100	2,579	58.48
1961	41,987	2,434	57.97
1962	36,946	1,990	53.87
1963	28,896	1,537	53.19
1964	23,987	1,301	54.23

Source: U.S. Imports for Consumption, Publication No. FT-110,
s.c. 8502000

Tariff Considerations

Calcium cyanamide is entered under tariff item 663a, "Cyanamide or lime nitrogen", free of duty under all Tariffs. It could be entered free of duty under item 663b when for use in the manufacture of fertilizers. At the public hearing, in March 1961, Cyanamid of Canada Limited requested that the product continue to be entered free of duty.⁽¹⁾

The proposal by Cyanamid was made at the hearing on B.T.N. heading 28.58. For classification under that heading, the product must contain more than 25 per cent, by weight, of nitrogen; for classification under heading 31.02 the nitrogen content must be not more than 25 per cent by weight. The product which the company produces contains 21 to 22 per cent by weight of nitrogen and therefore would be classified under B.T.N. heading 31.02, or under heading 31.05 if appropriately packaged.

The Canadian Federation of Agriculture expressed an interest in calcium cyanamide as a fertilizer and as a constituent of pesticides. The Federation proposed that there be no increase in the rates of duty for chemicals used as fertilizers or pesticides, and urged continued free entry under tariff item 663(a), which relates specifically to calcium cyanamide.⁽²⁾

At the hearing in March 1961, the Industry Committee proposed that calcium cyanamide be classified under heading 28.58 without regard to its nitrogen content.⁽³⁾ However, at a subsequent hearing on fertilizers, in May 1962, the Committee recommended that the Brussels classification for fertilizers be adopted which would permit differential

(1) Transcript, Vol. 34, p. 5043

(2) Same, Vol. 83, p. 12814

(3) Same, Vol. 34, p. 5040

treatment for calcium cyanamide according to its nitrogen content. The Committee suggested how the B.T.N. might be amended to permit differential treatment for the product when it was imported for use as a fertilizer or in the manufacture of mixed fertilizers, and when it was imported for other purposes.(1)

No other representations were made to the Board relating specifically to calcium cyanamide.

If B.T.N. heading 31.02 were used to classify calcium cyanamide it would apply only to a product which contained 25 per cent or less by weight of nitrogen. Existing tariff item 663a does not differentiate between calcium cyanamide on the basis of nitrogen content and if it were replaced by B.T.N. heading 31.02 provision would have to be made for calcium cyanamide which contained more than 25 per cent nitrogen by weight. B.T.N. heading 28.58 provides for the product containing the higher percentage of nitrogen. It should be noted that B.T.N. heading 31.02 provides for calcium cyanamide even when treated with oil. Under the existing Tariff such a product would probably be classified as a mixture under tariff item 220a(i) with rates of 15 p.c., B.P. and 20 p.c., M.F.N.

In support of its proposal for continued free entry for the product the spokesman for Cyanamid said that "calcium cyanamide is traded on a world wide basis as a duty-free chemical."(2)

He cited the fact that entry into the U.S.A., a substantial market for the product, is duty-free and urged, as the only producer in Canada, that free entry into Canada be continued.

OTHER PRODUCTS OF B.T.N. HEADING 31.02

Apart from ammonium nitrate, ammonium sulphate and calcium cyanamide, heading 31.02 pertains to the following:

Ammonium sulphonitrate, whatever the degree of purity;

Calcium nitrate containing not more than sixteen per cent by weight of nitrogen;

Calcium nitrate - magnesium nitrate, whatever the degree of purity;

Sodium nitrate containing not more than 16.3 per cent by weight of nitrogen;

Urea containing not more than 45 per cent by weight of nitrogen.

The five products listed above are classified in heading 31.02 "even when they are clearly not to be used as fertilisers."

(1) Transcript, Vol. 81, p. 12318 and following

(2) Same, Vol. 34, p. 5043

In addition, the heading also applies to certain mixtures; these "are classified in the heading only if of a kind used as fertilisers." The Explanatory Notes also state

"Subject to this condition, mixtures of the kind described ... may be in any proportion and without regard for any composition limits prescribed ... In the case of the products described in paragraph (D) [liquid fertilizers], however, the composition limit for urea [containing not more than 45 per cent by weight of nitrogen] is applicable. In consequence, an aqueous solution of urea containing more than forty-five per cent by weight of nitrogen falls in heading 29.25."(1)

The following mixtures are classified under heading 31.02, subject to the conditions noted in the preceding quotations.

1. Fertilizers consisting of any of the individual products of heading 31.02 mixed together.

2. Fertilizers consisting of ammonium chloride, or any of the individual products, or any of the individual products mixed together, mixed with chalk, gypsum or other inorganic non-fertilizing substances.

3. "Liquid fertilisers consisting of ammonium nitrate ... or of urea containing not more than forty-five per cent by weight of nitrogen, or of mixtures of those products, in an aqueous or liquid ammonia solution."

No data are available regarding ammonium sulphonitrate, calcium nitrate or calcium nitrate - magnesium nitrate, nor for the mixtures described by (1) and (2) above. The available information suggests that these are not commercially important fertilizers in Canada. Urea is discussed under heading 29.25.

Sodium Nitrate

Sodium nitrate is used in Canada mainly for the manufacture of explosives. About 700 tons out of a total of 17,000 to 20,000 tons which are currently used annually in Canada, are for fertilizers, mostly for direct application to the soil. At current prices of approximately \$50 per ton, in bags, fertilizer use would have an approximate value of \$35,000.

At the hearing on sodium nitrate (B.T.N. heading 28.39) the information given to the Board indicated that all of the sodium nitrate entering commercial trade would be at least 99 per cent pure. Pure sodium nitrate contains 16.48 per cent of nitrogen and a product of 99 per cent purity would contain 16.315 per cent of nitrogen. Thus it appears that all of the sodium nitrate which is sold commercially in Canada would be classified under heading 28.39 of the B.T.N. and not under heading 31.02. The product is discussed in some detail together with other products of heading 28.39.

(1) Explanatory Notes to the Brussels Nomenclature 1955, Third Impression, January 1964, p. 306

Liquid Fertilizer - Nitrogen Solutions

The liquid fertilizers which are included under heading 31.02 include the so-called nitrogen solutions. These solutions consist of either ammonium nitrate, urea, or a mixture of the two, in an aqueous or liquid ammonia solution. The proportions of each of the ingredients may vary considerably. Nitrogen solutions are sold on the basis of their nitrogen content and a comparison of the average value of imports and exports with corresponding price data suggests an average nitrogen content of approximately 40 per cent. Nitrogen solutions are known to be manufactured in Canada by Brockville Chemicals, Canadian Industries Limited, Consolidated Mining and Smelting Company of Canada Limited and Cyanamid of Canada Limited.

Canadian use of nitrogen solutions appears to be largely for the manufacture of mixed fertilizers. However, a considerable and rapidly increasing amount is also being applied directly to the soil. In 1962 about 65,000 tons were used for direct application and for the manufacture of fertilizers; in 1964 these uses probably accounted for about 90,000 tons. At the prices current in the U.S.A., in 1964, this amount of nitrogen solution would be valued at around \$6 million (assuming an average of 40 per cent of contained nitrogen).

Nitrogen Solutions Purchased for Direct Application to the Soil and For the Manufacture of Mixed Fertilizers 1959-64

	<u>Direct Application</u> (a)	<u>Manufacture</u> - tons -	<u>Total</u>
1959	2,415	36,347	38,762
1960	2,757	42,991	45,748
1961	6,408	51,363	57,771
1962	6,835	58,102	64,937
1963	8,022	..	..
1964	18,924	..	..

(a) Crop years ended June 30

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207; The Mixed Fertilizer Industry, Cat. No. 46-220

Nitrogen solutions are sold on the basis of their nitrogen content and prices are quoted per unit ton. That is, the published price is for one ton containing one per cent of nitrogen. In 1965, as in other recent years, the published price in the U.S.A. was \$1.64 per unit ton. If the product contained 40 per cent of nitrogen, the price per ton would be \$65.60 per ton.

Canada's foreign trade in nitrogen solutions is large and almost all of this trade appears to be with the U.S.A. In the mid-nineteen fifties imports were more than 35,000 tons annually with a value of around \$2 million. Imports declined and reached a low, in 1962, of seven thousand tons valued at about one-half million dollars.

They have increased in the past two years and in 1964 were 18,000 tons valued at about one million dollars.

Canadian export statistics do not tabulate nitrogen solutions separately. However, U.S. data show that exports from Canada to the U.S.A. have been much larger than total imports and have increased steadily in recent years. In 1960 Canada exported 49,000 tons to the U.S.A.; in 1964 about 75,000 tons were exported to the U.S.A. The value of exports increased from \$U.S. 2.4 million in 1960 to around \$U.S. 3.6 million in 1964.

Imports and Exports of Nitrogen Solutions,
1960-64

	<u>Imports</u>		<u>Exports</u> ^(a)		<u>Net Exports</u> ^(b)
	tons	\$'000	tons	\$'000	\$'000
1960	20,509	1,171	49,074	2,440	1,269
1961	29,082	1,838	61,626	3,174	1,336
1962	7,010	481	67,537	3,360	2,879
1963	8,349	515	74,550	3,658	3,143
1964	17,900	1,058	74,759	3,561	2,503

(a) Imports into the U.S.A. from Canada, in U.S. dollars

(b) Exports minus imports

Source: D.B.S., Trade of Canada, Imports, s.c. 8149; U.S. Imports for Consumption, FT-110, s.c. 5614080

Tariff Considerations

Ammonium sulphonitrate, calcium nitrate and calcium nitrate-magnesium nitrate are entered under tariff item 663, "fertilizers, compounded or manufactured, n.o.p.", when imported for direct application to the soil. Sodium nitrate is entered under tariff item 210e, "nitrate of soda or cubic nitre" when for direct application. All of the foregoing are entered under item 663b when for use in the manufacture of fertilizers. The rates under item 663 are Free, B.P. and 5 p.c., M.F.N., and under items 210e and 663b, entry is free under all Tariffs.

Calcium nitrate and sodium nitrate are classified in heading 31.02 only when they contain less than a specified percentage of nitrogen; calcium nitrate would be classified under heading 28.39 if it contained more than 16 per cent of nitrogen and sodium nitrate would be under heading 28.39 if it contained more than 16.3 per cent of nitrogen. The Canadian Customs Tariff makes no distinction based on nitrogen content.

Under the existing tariff and regardless of its nitrogen content, calcium nitrate would be entered under item 663 if for direct application and under item 663b if for the manufacture of fertilizers. Similarly, sodium nitrate, regardless of its nitrogen content would be classified under item 210e if for direct application and under item 663b if for the manufacture of fertilizers. If imported for use other

than as a fertilizer, and regardless of nitrogen content, calcium nitrate would probably be entered under item 208t or 664a and sodium nitrate would be entered under item 210e.

The relationship of the B.T.N. classification and that of the existing Tariff, for the relevant products, is shown in the following tabulation. All of the products which are listed would be entitled to entry under tariff item 663b, when imported for use in the manufacture of fertilizers.

	<u>B.T.N.</u>	<u>Application to Soil</u>			<u>Non-fertilizer Use</u>		
		<u>Item</u>	<u>B.P.</u>	<u>M.F.N.</u>	<u>Item</u>	<u>B.P.</u>	<u>M.F.N.</u>
Ammonium							
sulphonitrate	31.02	663	Free	5 p.c.	208t ^(a)	Free	15 p.c.
Calcium nitrate							
not more than							
16% of N	31.02	663	Free	5 p.c.	208t ^(a)	Free	15 p.c.
more than 16%							
of N	28.39	663	Free	5 p.c.	208t ^(a)	Free	15 p.c.
Calcium nitrate							
- magnesium							
nitrate	31.02	663	Free	5 p.c.	711	15 p.c.	20 p.c.
Sodium nitrate							
not more than							
16.3% N	31.02	210e	Free	Free	210e	Free	Free
more than							
16.3% N	28.39	210e	Free	Free	210e	Free	Free
Dry fertilizer							
mixtures as							
specified for							
31.02	31.02	663	Free	5 p.c.	(220a(i)	15 p.c.	20 p.c.
					(711	15 p.c.	20 p.c.
<u>Liquid Fertilizers</u>							
Ammonium nitrate:							
in aqueous							
solution;	31.02	663	Free	5 p.c.	208j	Free	25 p.c.
in liquid							
ammonia							
solution	31.02	663	Free	5 p.c.	220a(i)	15 p.c.	20 p.c.
Urea, not over							
45% N							
in aqueous							
solution	31.02	663	Free	5 p.c.	711	15 p.c.	20 p.c.
in liquid							
ammonia							
solution	31.02	663	Free	5 p.c.	220a(i)	15 p.c.	20 p.c.
Ammonium nitrate							
and urea not							
over 45% N,							
mixed, in							
aqueous or							
ammonia							
solution	31.02	663	Free	5 p.c.	220a(i)	15 p.c.	20 p.c.

(a) If ruled to be made in Canada, would be item 711, 15 p.c., B.P. and 20 p.c., M.F.N.

Ammonium sulphonitrate and calcium nitrate - magnesium nitrate are classified under heading 31.02, regardless of their purity or of their intended use. Under the existing Tariff, ammonium sulpho-nitrate, if not entitled to entry under tariff items 663 or 663b, would probably be classified by item 208t if ruled as of a kind not produced in Canada and under item 711 if ruled to be made in Canada. Calcium nitrate - magnesium nitrate when entered for use other than as a fertilizer or for the manufacture of fertilizer would probably be entered under tariff item 711 or item 220a(i).

The mixtures which are specified in heading 31.02 are classified under that heading if they are of a kind used as fertilizers, which would be the usual situation. If, however, any mixture was not of a kind used as a fertilizer it would be classified elsewhere. If it was not specially formulated for some other use, it would probably be classified under heading 38.19 which provides for chemical products or preparations not elsewhere specified or included. With one exception, under the Canadian Customs Tariff, these mixtures, if not entitled to entry under tariff items 663 or 663b, would probably be entered under items 220a(i) or 711. Ammonium nitrate in aqueous solution, if imported for non-fertilizer use, would be entered under tariff item 208j, Free, B.P. and 25 p.c., M.F.N.; it might also be entered under item 208i, if for use in the manufacture of nitrous oxide at rates of Free, B.P., 10 p.c., M.F.N.

If the provisions of existing item 663b were continued and the provisions of item 663 were extended to include sodium nitrate, tariff item 663 and 663b would apply to all of the products tabulated above, when imported for use as a fertilizer or for the manufacture of fertilizers.

If, in addition, the B.T.N. were adopted as a classification for chemicals and fertilizers, heading 28.39 would provide a classification for calcium nitrate containing more than 16 per cent of nitrogen and for sodium nitrate containing more than 16.3 per cent of nitrogen. Urea containing more than 45 per cent by weight of nitrogen whether dry or in aqueous solution is classified under heading 29.25; and aqueous or ammoniacal solutions consisting of a mixture of urea containing more than 45 per cent of nitrogen and ammonium nitrate, would probably be classified by heading 38.19. Heading 31.02 would relate to the products which are included in the heading regardless of their purity and to those which would be excluded from headings 28.39, 29.25 and 38.19, because of their lower nitrogen content.

The general proposals regarding fertilizers are discussed in a preceding part of the report dealing with the fertilizers of B.T.N. Chapter 31. The following discussion reviews only the proposals that were made regarding the particular products under discussion.

The Canadian Federation of Agriculture expressed an interest in ammonium sulphate nitrate (presumably ammonium sulphonitrate) and calcium nitrate as constituents of fertilizers and requested that the existing provisions of the Customs Tariff for fertilizers and materials used for the manufacture of fertilizers be continued.⁽¹⁾ The Federation did not specify the purity of the calcium nitrate to which it referred.

(1) Transcript, Vol. 83, p. 12813

Several proposals were made to the Board regarding sodium nitrate. However, because it appears that the sodium nitrate which enters commercial trade in Canada would be classified under heading 28.39 the subject is treated under that heading. As already noted, urea is discussed under heading 29.25.

No other proposals were made to the Board related specifically to any of the products under discussion.

MINERAL OR CHEMICAL FERTILISERS, PHOSPHATIC - B.T.N. 31.03

INTRODUCTION

The following products are classified under heading 31.03 of the Brussels Tariff Nomenclature:

- A. 1. Basic slag
- 2. Disintegrated (calcined) calcium phosphates
- 3. Calcined natural aluminum calcium phosphates
- 4. Superphosphates (single, double or triple)
- 5. Calcium hydrogen phosphate containing not less than 0.2 per cent by weight of fluorine
- B. Fertilizers consisting of any of the above, mixed together
- C. Fertilizers consisting of any of the products in A or B above, mixed with inorganic non-fertilizing substances.

The products listed in A are classified in heading 31.03 even when they are clearly not to be used as fertilizers. Those listed in B or C are classified in the heading only if of a kind used as fertilizers.⁽¹⁾

Except for the superphosphates, there are few data available regarding the products classified under heading 31.03. The superphosphates are discussed in the section below, followed by a discussion of the other products of heading 31.03.

SUPERPHOSPHATES

Superphosphates are produced by the action of either sulphuric acid or phosphoric acid on phosphate rock. Phosphate rock, which is essentially calcium phosphate, reacts with sulphuric acid to form single superphosphate (a mixture of monocalcium and dicalcium phosphate) and calcium sulphate (gypsum). Single superphosphate typically contains the equivalent of about 18 to 21 per cent of available soluble phosphoric acid. Triple superphosphate is formed when phosphate rock reacts with phosphoric acid. In this reaction the production of calcium sulphate is avoided and the resulting superphosphate contains more than twice as much soluble phosphoric acid, about 46 per cent.

(1) Explanatory Notes to the Brussels Nomenclature 1955, Third Impression, January 1964, p. 307

Superphosphates are used for direct application to the soil and also for the manufacture of mixed fertilizers. They are not known to be used for other purposes. Superphosphates are the principal source of phosphorus in mixed fertilizers.

Superphosphates were produced by three companies in 1964, Consolidated Mining and Smelting Company of Canada Limited (Cominco) at Trail, B.C., Electric Reduction Company (Erco), at Port Maitland, Ontario, and Canadian Industries Limited (C.I.L.), at Beloeil, Quebec. The first two companies are by far the largest producers. Erco is a relatively new producer of superphosphates, having started production of them in 1962.

The Market

In 1962 Canada consumed about 373,000 tons of single superphosphate and 86,000 tons of triple superphosphate. At prices current in mid-1962, in the U.S.A., the single would have had a value of nearly \$7 million, and the triple superphosphate would have been valued at around \$4 million. Thus, the total value of Canadian use in 1962 would have been of the order of \$11 million. Imports of superphosphates, in 1962, were valued at \$4.8 million, indicating that the value of Canadian-produced superphosphates consumed in Canada in that year had a value of approximately \$6.2 million. In addition, Canadian exports of superphosphates to the U.S.A. were valued at \$2.7 million, suggesting a total value of Canadian shipments of about \$9 million.

Superphosphates Purchased for Direct Application and for the Manufacture of Mixed Fertilizers, 1958-64

	<u>Single</u>			<u>Triple</u>		
	<u>Direct</u> <u>Applic.</u> - '000 tons -	(a) <u>For</u> <u>Mfr.</u>	<u>Total</u>	<u>Direct</u> <u>Applic.</u> - '000 tons -	(a) <u>For</u> <u>Mfr.</u>	<u>Total</u>
1958	29	315	343	2	43	45
1959	33	340	373	2	55	57
1960	33	305	337	2	71	73
1961	38	334	372	2	76	77
1962	35	338	373	2	85	86
1963	35	..	..	2	..	..
1964	36	..	..	4	..	..

(a) Crop years ended June 30

Source: Derived from D.B.S., Fertilizer Trade, Cat. No. 46-207;
Manufacturers of Mixed Fertilizers, Cat. No. 46-220

The use of superphosphates in Canada has been increasing in recent years, most or all of the increase being of the more concentrated form. In terms of phosphoric acid content, the Canadian use of single superphosphate has declined from about 80 per cent of the total use of superphosphates in 1958 to approximately 65 per cent in 1962.

It is estimated that the total use of superphosphates, in terms of phosphoric acid, was around 90,000 tons in 1958 and 115,000 tons in 1962, an increase of more than 25 per cent in this five-year period. In the same period the contained phosphoric acid in all fertilizers and fertilizer materials sold in Canada increased from 127,000 tons to 197,000 tons, a rise of 55 per cent. Ammonium phosphate is the other major phosphatic fertilizer material; it is discussed under heading 31.05. Thus, until 1962, the domestic use of superphosphates did not expand as rapidly as the utilization of other phosphatic materials and as a result, superphosphates, which supplied almost three-quarters of the phosphoric acid in fertilizers sold domestically in 1958, supplied less than 60 per cent of the total in 1962.

As the preceding table indicates, most of the superphosphate sold in Canada is for the manufacture of mixed fertilizers. This is true for both the single and triple form. In 1962, sales of superphosphates for direct application to the soil were equivalent to approximately 8,000 tons of phosphoric acid, only seven per cent of the total; an estimated 107,000 tons of phosphoric acid were represented by purchases for the manufacture of mixed fertilizers.

The Canadian market for superphosphates has a distinct, regional pattern. In a preceding general part of this section on fertilizers, it was pointed out that the mixed fertilizer industry was located mainly east of Manitoba, particularly in Ontario and Quebec. It was also noted that mixed fertilizers are not shipped long distances because of the transportation costs involved. Therefore, since the mixed fertilizer industry accounts for more than 90 per cent of the Canadian sales of superphosphates (in terms of phosphoric acid), the bulk of the Canadian market appears to be mainly east of Manitoba, and is concentrated chiefly in Ontario and Quebec.

Purchases of superphosphates for direct application to the soil are also mainly in these provinces. For example, in the crop year 1963-64, 94 per cent of the sales of single superphosphate for this purpose were in Ontario and Quebec, 68 per cent in Ontario. Ontario also accounted for more than 80 per cent of the sales of triple superphosphate for direct application. As is shown in the table which follows, sales of superphosphates in the Prairies are very small; this region obtains most of its phosphoric acid from ammonium phosphate.

Sales of Superphosphates for Direct Application
to the Soil, Crop Years, 1961-62 to 1963-64

Crop Years Ended June 30	Atlantic Provs.	Que.	Ont.	Prairie Provs.	B.C.	Canada
<u>Single Superphosphate</u>						
			-	tons	-	
1961-62	1,126	10,607	21,742	2	1,177	34,654
1962-63	1,065	8,706	23,828	2	1,051	34,652
1963-64	1,124	9,302	24,293	-	962	35,681
<u>Triple Superphosphate</u>						
1961-62	-	1	1,088	50	648	1,787
1962-63	19	266	1,215	-	556	2,056
1963-64	26	22	2,922	46	571	3,587

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207

The superphosphates which are sold commercially contain varying amounts of available phosphoric acid and they are priced on the basis of the phosphoric acid which they contain. Canadian prices are not published, but in the U.S.A. prices are quoted per unit ton (a ton of the product containing one per cent of phosphoric acid). In 1964 the price of single superphosphate in bulk, f.o.b. Cartaret, New Jersey, and Baltimore, Maryland, was 93 cents a unit ton or \$18.60 for a product containing 20 per cent of available phosphoric acid. During the same year, triple superphosphate, f.o.b. vessel, at Florida ports, was quoted at \$1.05 per unit ton, or \$48.30 per ton for a material containing 46 per cent of phosphoric acid. Although single superphosphate provides phosphoric acid at a lower cost, the triple superphosphate, because of its much higher concentration of phosphoric acid, is more economical to transport particularly where long distances are involved.

Foreign Trade

Until the Electric Reduction Company (Erco) began large scale production of superphosphates at Port Maitland, Ontario, most Canadian output was by the Consolidated Mining and Smelting Company (Cominco), in British Columbia. Because the Prairies and British Columbia did not constitute a large market for these products, a large part of Cominco's production was exported. At the same time, however, the principal market area for superphosphates, in Eastern Canada, was largely dependent on imports to supply its requirements of these products.

Superphosphates Purchases and Imports, 1958-64

	<u>Single</u>			<u>Triple</u>		
	<u>Purch.</u>	<u>Imports</u>	<u>% Imports</u>	<u>Purch.</u>	<u>Imports</u>	<u>% Imports</u>
	'000 tons		of Purch. per cent	'000 tons		of Purch. per cent
1958	343	173	50	45	44	100
1959	373	142	38	57	64	100
1960	337	120	36	73	83	100
1961	372	125	34	77	67	100
1962	373	110	29	86	55	64
1963	..	84	..	..	42	..
1964	..	113	..	..	63	..

Source: Derived from D.B.S., Fertilizer Trade, Cat. No. 46-207;
Manufacturers of Mixed Fertilizers, Cat. No. 46-220;
Trade of Canada, Imports, s.c. 8161 and s.c. 8162

Since the establishment of Erco as a major producer of superphosphates, in 1962, Canadian imports have declined in relation to total purchases and exports have risen sharply, particularly of triple superphosphates. Until 1962 imports of both kinds greatly exceeded exports and imports of single superphosphates continued to be much larger than exports even after 1962. However, by far the most significant factor in Canada's international trade in these products has been the very

impressive increase in exports of triple superphosphates which seems likely to give Canada a favourable balance in the value of trade in this product within a year or two.

Between 1954 and 1958 imports of single superphosphate varied between 165,000 and 185,000 tons annually, valued at between \$3.1 million and \$3.4 million. In 1964 they amounted to 113,000 tons valued at \$2.1 million, a decrease of more than one-third in value from the mid-nineteen fifties. Imports of triple superphosphate reached a peak of 83,000 tons in 1960 when they were valued at \$3.9 million. They declined to 42,000 tons in 1963 but increased again in 1964 to 63,000 tons valued at \$3.7 million, likely reflecting the strong demand for phosphatic fertilizers in Canada in that year. Imports of superphosphates were almost entirely from the U.S.A.

Imports of Superphosphates, Selected Years,
1954-64

	<u>Single Superphosphate</u>		<u>Triple Superphosphate</u>		<u>Total</u>
	'000 tons	\$'000	'000 tons	\$'000	\$'000
1954	180.2	3,432	19.9	903	4,335
1956	184.0	3,421	38.5	1,741	5,162
1958	173.4	3,292	44.2	2,020	5,312
1960	119.7	2,178	83.1	3,926	6,104
1961	124.6	2,232	67.4	3,392	5,624
1962	109.8	2,026	55.5	2,769	4,795
1963	83.9	1,597	41.9	2,068	3,665
1964	112.6	2,142	63.3	3,685	5,827

Source: D.B.S., Trade of Canada, Imports, s.c. 8161 and s.c. 8162

Canadian export statistics do not show superphosphates separately. However, all or almost all of the exports have been to the U.S.A.; the table which follows shows the imports into the U.S.A. from Canada. The data indicate that exports of single superphosphate have not increased significantly since the 1950's and they remain unimportant relative to exports of triple superphosphates. Exports of the latter product have increased from a few hundred tons in the late nineteen fifties, to nearly 80,000 tons, valued at more than four million dollars in 1964. Thus in a period of five years (1959 to 1964) the net import balance has declined from approximately \$5.4 million to \$1.8 million.

Exports of Superphosphates to the U.S.A.
1958-64

	<u>Single Superphosphate</u>		<u>Triple Superphosphate</u>		<u>Total</u>
	tons	\$'000	tons	\$'000	\$'000
1958	93	4	554	33	37
1959	43	2	959	58	60
1960	1,245	27	1,025	55	82
1961	1,289	25	2,179	136	161
1962	1,990	43	49,674	2,692	2,735
1963	1,269	56	37,139(a)	2,012(a)	2,068
1964	..	..	78,656(a)	3,991(a)	3,991

(a) Includes single superphosphate

Source: U.S. Imports for Consumption, FT-110, s.c. 8519300,
s.c. 8519400 and s.c. 5612000

Tariff Considerations

When superphosphates are imported for use as fertilizers, they are entered under tariff item 663 as manufactured or compounded fertilizers at rates of Free, B.P. and 5 p.c., M.F.N. When imported for use in the manufacture of fertilizers they are entered under item 663b, free of duty under all Tariffs. If either single or triple superphosphate were imported for any other purpose they would be classified under tariff item 218, as "acid phosphate, not medicinal", at rates of Free, B.P., and 25 p.c., M.F.N.

In the Brussels Tariff Nomenclature, all superphosphates are classified under heading 31.03, "mineral or chemical fertilisers, phosphatic", regardless of their intended use.

At the present time superphosphates are known to be used only as fertilizers or as materials for the manufacture of fertilizers. In this context tariff items 663 and 663b correspond with the provisions of B.T.N. heading 31.03 regarding these products. If superphosphates began to be used for other purposes the provisions of heading 31.03 would continue to apply although existing items 663 and 663b would not be applicable.

At the public hearings on fertilizers and at other hearings of Reference 120 - Chemicals, several companies and associations made general representations relevant to superphosphates. These are discussed in a preceding section which deals with the subject of fertilizers in general. The Canadian Federation of Agriculture expressed an interest in superphosphate in a general submission dealing with fertilizers. The representations of the Federation are also discussed in the above-mentioned general section on fertilizers.

The Electric Reduction Company (Erco) expressed an interest in phosphatic fertilizers of heading 31.03, including single and triple superphosphate. The company recommended that these products be classified under an item worded like heading 31.03 of the B.T.N. and bear-

ing the rates which now apply to tariff item 663, namely, Free, B.P. and 5 p.c., M.F.N.⁽¹⁾ In effect, the proposal was for a continuation of the existing rates for superphosphates. However, heading 31.03 applies to other phosphatic fertilizers, for example, basic slag and calcined calcium phosphates. Erco's rate proposal was limited to the superphosphates which are classified under heading 31.03; the company made no proposals regarding rates of duty for any of the other products classified by the heading.

Consolidated Mining and Smelting Company of Canada Limited (Cominco) also expressed an interest in superphosphate as a manufacturer of the product.⁽²⁾ In its submissions to the Board the company consistently opposed any increase in rates of duty for chemicals. In connection with manufactured or compounded fertilizers which are entered under tariff item 663, the company proposed that the rates should be reduced to free entry under all Tariffs. The existing rates under this item are Free, B.P. and 5 p.c., M.F.N.

OTHER PRODUCTS OF B.T.N. HEADING 31.03

Basic Slag

The Explanatory Notes to the B.T.N. refer to basic slag as follows:

"Basic slag (also known as 'Thomas slag', 'Thomas phosphates', 'phosphatic slag' or 'metallurgical phosphates'). It is a by-product of the manufacture of steel from phosphatic iron in basic furnaces or converters."⁽³⁾

The product is known to be used in Canada for direct application to the soil, as a source of phosphoric acid; it is not known if it is used in the manufacture of mixed fertilizers.

The total known use of basic slag as a fertilizer has varied from 600 tons to about 800 tons between 1958 and 1963. Its use in the crop year of 1963-64 was only 205 tons. Almost all of the Canadian consumption for this purpose is in the province of Quebec; only an occasional few tons were used in Ontario.

There are no known imports of basic slag, but U.S. data indicate that there are exports from Canada to the U.S.A. Exports are not regular, but are sometimes significant. For example, in 1960 and 1964 there were no exports to the U.S.A., while in 1962, 2,253 tons valued at \$157,000 were exported.

If imported for application to the soil, basic slag is entered into Canada under tariff item 372, "electric and blast furnace slag", free of duty under both the B.P. and M.F.N. Tariffs. This item is

(1) Transcript, Vol. 83, p. 12762

(2) Same, Vol. 5, p. 712

(3) Explanatory Notes to the Brussels Nomenclature 1955, Third Impression, Vol. 1, p. 306

outside the terms of Reference 120. If entered for use in the manufacture of fertilizers the product would be classified under tariff item 663b, free of duty under both the B.P. and M.F.N. Tariffs.

The Canadian Federation of Agriculture listed basic slag as a fertilizer in which it had an interest; the representations of the Federation are discussed in a preceding section which deals with fertilizers in general.

Other Products

Heading 31.03 specifies the following single products in addition to those already discussed under this heading: disintegrated (calcined) calcium phosphates, calcined natural aluminum calcium phosphates, and calcium hydrogen phosphate containing not less than 0.2 per cent by weight of fluorine. There are no data available regarding their importance in Canadian commerce.

The heading also includes any of the single products classified by the heading, mixed together, or any of these mixtures or single products when mixed with inorganic fertilizing substances. There are no data available regarding these.

The representations that were made to the Board, which would relate to these products, were general in nature and are discussed in a preceding part of this chapter.

It should be noted that the Canadian Federation of Agriculture listed dicalcium phosphate as a constituent of fertilizers in which the Federation was interested. Because the Federation's proposals were concerned with fertilizers in general, they are also dealt with in the general section.

All of the products or mixtures referred to above would be entered under tariff item 663b if imported for use in the manufacture of fertilizers. If imported for direct application to the soil, the mixtures and calcined natural aluminum calcium phosphates would be entered under tariff item 663, but disintegrated calcium phosphates and calcium hydrogen phosphate containing not less than 0.2 per cent of fluorine would be entered under tariff item 711, with rates of 15 p.c., B.P. and 20 p.c., M.F.N.

When imported for non-fertilizer use the mixtures might be classified under item 220a(i) or 711, both of which bear rates of 15 p.c., B.P. and 20 p.c., M.F.N. For non-fertilizer use disintegrated calcium phosphates and calcium hydrogen phosphate would remain under item 218, but calcined natural aluminum calcium phosphates would probably be classified under item 711.

Because of the absence of information and representations on these various products, it is assumed that they are not of major commercial significance in Canada. Most would probably be covered by representations which were made to the Board regarding fertilizers in general.

MINERAL OR CHEMICAL FERTILISERS, POTASSIC - B.T.N. 31.04INTRODUCTION

Heading 31.04 of the Brussels Tariff Nomenclature relates to the following:

- A. 1. Crude natural potassium salts (carnallite, kainite, sylvinite, etc.)
- 2. Crude potassium salts obtained in the sugar industry from residues of beet molasses.
- 3. Potassium chloride, whatever its degree of purity.
- 4. Potassium sulphate containing not more than 52 per cent by weight of potassium oxide.
- 5. Magnesium sulphate - potassium sulphate containing 30 per cent or less by weight of potassium oxide.
- B. Fertilizers consisting of any of the above mixed together, only if of a kind used as fertilizers.

Potassium chloride is by far the most important of the above materials; its production in 1964 was valued at almost \$31 million. Potassium sulphate is often used as a substitute source of potassium for crops which cannot tolerate the chloride. Potassium sulphate, in the fertilizer grade, is not produced in Canada and annual imports vary between \$750,000 and \$1,000,000. Magnesium sulphate - potassium sulphate (sulphate of potash magnesia) also is not available from Canadian production and imports are valued, currently, at about \$85,000 per year.

The discussion which follows deals with each of the above-mentioned materials, in the order given.

POTASSIUM CHLORIDE

Potassium chloride occurs naturally in minerals such as sylvite (sylvinite), carnallite and kainite, and is valued for its potassium content; sylvite, because of its high potassium content, is the most valuable of the group. For some applications, for example fertilizing the soil, the minerals can be used without refining; for chemical applications, a highly refined material, exceeding 99 per cent or more of potassium chloride is used.

Very extensive deposits of sylvite exist in Saskatchewan, and large scale development of these was undertaken in 1958. Serious problems arose because of the seepage of water into the shaft linings and it was not until late in 1962 that the Saskatchewan deposits were brought into large scale production. Until 1962, the state of New Mexico was the principal North American source of these minerals.

The Canadian Minerals Yearbook 1963, states:

"Potash is one of the three basic ingredients in mixed chemical fertilizers, the others being phosphorus and nitrogen. The familiar grade notations on packaged fertilizers, such as 5-10-15, indicate the percentage content of nitrogen, phosphate and potash in that order. As fertilizer, potash contributes to healthy plant growth and assures the maximum of balanced development by regulating the intake of other fertilizer ingredients.

"About 95 per cent of the potash produced is used as fertilizer, five per cent is used in the form of various chemicals of which potassium hydroxide has the widest application. Most fertilizer potash is used as concentrates of muriate (KCL) in various strengths, mixed with other ingredients. Smaller amounts are used as potassium sulphate for particular soils and crops."

Potassium chloride is available commercially in several grades whose potassium content is specified either in terms of equivalent potassium oxide (K_2O) or potassium chloride (KCL). The commercially important grades are given below. In addition to these, very pure forms are also available for use as a chemical reagent and for pharmaceutical manufacture.

	<u>Minimum K_2O Equivalent</u>	<u>Minimum KCL Equivalent</u>
Potassium manure salts	20 ^(a)	31.6
Potassium muriate, standard grade	60 ^(a)	94.8
Potassium chloride, chemical grade	63.26	99.95 ^(a)

(a) The usual commercial designation

The Industry

Canadian developments in potash were reviewed in the following terms in the Canadian Minerals Yearbook 1962.

"A new mineral industry was added to the impressive Canadian list when the large-scale potash mining and processing operation of International Minerals & Chemical Corporation (Canada) Limited (IMC) at Esterhazy, Saskatchewan, was successfully brought into production in August 1962. Energy, unusual engineering skill and persistence have been necessary to solve the problems of sinking a shaft to the potash deposits ... At year-end the plant was operating at near capacity and shipments were being made to Canadian and foreign purchasers."

The 1963 Yearbook stated:

"In September 1963 the first full year of potash production was completed in Canada and by December 31 more than one million tons of muriate of potash had been produced. International Minerals & Chemical Corporation (Canada) Limited (IMC), the single producer in Canada during 1963, reached the capacity of its Esterhazy, Sask., facilities and announced plans for expansion of the present plant and the start of a new shaft to triple productive capacity by 1968. Two other companies, Potash Company of America and Kalium Chemicals Limited, were completing facilities at year end and planned to start potash production during 1964.

"These and other companies in earlier stages of development are expected to raise Canada's potash productive capacity from about ten per cent of the world total in 1964 to 15 per cent by 1966 and to 20 per cent or more by 1970."

The 1963 article discusses the very large investments for exploration, the development of the deposits and the construction of shafts and plants, and estimates that to the end of 1963 more than \$200 million had been spent in Saskatchewan for these purposes. The article also assesses the competitiveness of Saskatchewan-produced potash and states:

"The vast reserves of high grade material in Saskatchewan make this area an attractive source of potash despite the high development cost. In attempting, therefore, to assess the position of Canada in the world potash industry, consideration must be given to the volume and quality of Canadian potash, the cost of production, transportation and marketing, and also the rate at which world-wide potash demand is increasing ...

"It is widely acknowledged that the reserves in western Canada, with their high-quality potash, are the most attractive of all known world deposits, and it is probable that modern plants based on these deposits will have unit costs lower than any in the world."

The magnitude of the development of the Saskatchewan deposits is tremendous. Various reports indicate that between 1964 and 1970 at least one-half billion dollars will have been spent in the further exploitation of them. The table which follows lists the companies which had already started production or construction by 1965, or were committed to start construction by 1967, according to announcements by the various interests involved. The consummation of these plans could result in an annual production of 11.4 million tons of potash in Saskatchewan by 1970, the equivalent of total world production of potash in 1963.⁽¹⁾

In addition, several companies have announced that they are actively exploring potash rights which they hold in the province and

(1) The information cited here and in the following, was abstracted from an article by C.M. Bartley in the Canadian Mining Journal, February 1965, p. 130-3

are planning to begin construction between 1968 and 1970. C.M. Bartley estimates that these projects may result in additional productive capacity of 4.5 million tons in 1971 or 1972. Companies which are in this category include Noranda Mines, Shell Canada, Sifto Salt, Southwest Potash (American Climax) and others.

Potential Production of Potash in Saskatchewan, by 1970

	Estimated Productive Capacity <u>'000 tons</u>	Estimated Cost <u>\$ million</u>	Estimated Year of Production
<u>Started or Committed</u>			
International Minerals & Chemical	1,600	40	1962
	2,500	10 ^(a)	1967
Potash Co. of America	600	37	1965
Kalium Chemical Ltd.	700	40	1964
Alwinsal Potash	1,000	50	1968
U.S. Borax & Chemical	<u>1,000</u>	<u>60</u>	1968
	7,400	237	
<u>Construction Planned 1965-67</u>			
Canberra Oil	1,000	50	1968
Consolidated Mining & Smelting	1,000	50	1969
Continental Potash	1,000	50	1969
Duval Corp.	<u>1,000</u>	<u>40</u>	1970
	4,000	190	
<u>Construction Planned 1968 & 1969</u>			
	4,500	210	1971 & 1972

(a) Excludes cost of plant

Source: Adapted from C.M. Bartley, Potash, Canadian Mining Journal, February 1965, p. 131

Most of the Saskatchewan production will be by shaft mining. However, Kalium Chemical, which is already in production, is using a solution mining process and a few other companies may also adopt this method of extracting potash from underground deposits. Solution mining results in a purer product than is possible with normal shaft mining methods. However, even the solution mining process is not likely to yield the chemical grade, which is a minimum of 99.95 per cent of potassium chloride. The costs of the additional refining required to produce the chemical grade are suggested by the fact that in April, 1965, in the U.S.A., the standard, agricultural grade in bulk, was priced at \$25.80 a ton (60 per cent K₂O) and the chemical grade was \$33 a ton, 28 per cent higher in price.

The Market

Between 1957 and 1964 Canadian use of potassium chloride increased from 137,000 tons to an estimated 218,000 tons, valued in 1964 at approximately \$5 million. Most of the potassium chloride that is consumed in Canada is for the manufacture of mixed fertilizers and for direct application to the soil. Other uses are small and probably account for less than five per cent of the total. Most of the Canadian consumption is of the relatively impure, fertilizer grades; for other applications a product of high purity (99.95 per cent or more of potassium chloride) is ordinarily required.

Apparent Domestic Disappearance of Potassium Chloride, 1957-64

	<u>Est. Prod.</u>	<u>Imports</u>	<u>Exports</u> ^(a) - thousand tons -	<u>Apparent Disappearance</u>	<u>Estim. Use As Fertilizer</u>
1957	-	137	-	137	129
1958	-	131	*	131	127
1959	59	95	8	147	139
1960	8	147	7	148	144
1961	-	170	*	170	163
1962	133	148	95(b)	186(b)	179(b)
1963	1,045	74	922(b)	197(b)	190(b)
1964	1,437	67	1,287(b)	218(b)	211(b)

(a) 1957-1961, imports into U.S.A. from Canada, U.S. data

(b) Estimated

Source: Derived from various publications of the D.B.S.; the Canadian Minerals Yearbook; U.S. Imports for Consumption, FT-110; and other publications

Potassic fertilizers are used mainly in provinces east of Manitoba, particularly in Ontario. In the crop year of 1963-64, the fertilizers used in provinces east of Manitoba contained the equivalent of 117,400 tons of potassium oxide (K_2O), 97 per cent of the total use in Canada of 120,700 tons. Ontario alone accounted for 75,800 tons, or 63 per cent of the Canadian use, in terms of K_2O .

Potassium chloride is by far the most important source of the K_2O accounted for in the preceding table. However, it should be noted that the potash contained in other fertilizer materials is also included in the above, for example, the potash contained in potassium sulphate and potassium magnesium sulphate. The consumption of and therefore the demand for potassic fertilizers is obviously mainly east of the Great Lakes.

The chemical grade of potassium chloride is used in the production of potassium hydroxide, potassium chlorate, synthetic rubber, and various other products, the principal use in Canada being for potassium hydroxide. The cruder forms cannot be used in place of the

chemical grade because of the impurities which they contain. On the other hand, the higher cost of the chemical grade makes its use in the manufacture of fertilizers unlikely. Thus the market for the chemical grade of potassium chloride is generally quite different from that for the agricultural and mine-run grades.

Potash Contained in Fertilizers Sold in Canada, by Regions,
Crop Years, 1962-63 and 1963-64

	<u>1962-63</u>			<u>1963-64</u>		
	<u>In</u>	<u>In</u>	<u>Total</u>	<u>In</u>	<u>In</u>	<u>Total</u>
	<u>Materials</u>	<u>Mixtures</u>		<u>Materials</u>	<u>Mixtures</u>	
	as thousand tons contained K ₂ O					
Atl. Provs.	0.1	17.3	17.4	0.2	17.1	17.2
Quebec	0.4	23.7	24.1	0.3	24.0	24.4
Ontario	8.3	59.2	67.5	12.7	63.2	75.8
Prairies	0.1	0.3	0.3	0.1	0.4	0.5
B.C.	0.8	1.9	2.6	0.8	2.0	2.8
Canada	9.7	102.3	112.0	14.1	106.6	120.7

Source: D.B.S., Fertilizer Trade, Cat. No. 46-207

Most of the Canadian market for the chemical grade is at Buckingham, Quebec (Erco); Cornwall, Ontario (C.I.L.); Sarnia, Ontario (Polymer); Trail, B.C. (Cominco); and Vancouver, B.C. (C.I.L.). In 1960, Canadian Industries Limited (C.I.L.) and in 1961, Consolidated Mining and Smelting Company of Canada Limited (Cominco) began to use the chemical grade as the raw material for the production of potassium hydroxide. The Electric Reduction Company (Erco) uses this grade in the manufacture of potassium chlorate and Polymer Corporation uses it in the production of synthetic rubber.

The demand for the chemical grade rose sharply after C.I.L. and Cominco began to manufacture potassium hydroxide. However, even after this expansion the use of the chemical grade was not very large, amounting to less than 5,000 tons in 1961. Erco and C.I.L. agreed that it was unlikely that the chemical grade of potassium chloride would be produced in Canada in the foreseeable future.⁽¹⁾

Pricing Policy and Prices

Potash is sold in Canada and in the U.S.A., f.o.b. works, on the basis of its potassium oxide content. Prices are quoted per unit ton. One unit-ton is 2,000 pounds of potash containing one per cent of potassium oxide equivalent. Thus a product designated as 60 per cent K₂O (potassium oxide equivalent), a common designation, priced at 40 cents a unit ton, would have a value of \$24 per ton. The material containing 60 per cent K₂O would contain 94.8 per cent of potassium chloride.

In June, 1962, International Minerals and Chemical Corporation Canada Limited (I.M.C.), at that time the only Canadian producer, issued

⁽¹⁾ Transcript, Vol. 21, p. 3085-6, 3092

the following schedule of Canadian potash prices on materials contracted for prior to July 1, 1963. Contracts subsequent to June 30, 1963 were five per cent higher.

Potash Prices, July and August, 1963, in Canadian Funds,
f.o.b. Mine, Saskatchewan

	<u>In Bulk</u>		<u>Bagged</u>
	<u>¢ per unit</u>	<u>\$ per ton^(a)</u>	<u>\$ per net ton^(a)</u>
Standard muriate, min. 60% K ₂ O	37.5	22.50	28.35
Coarse muriate, min. 60% K ₂ O	38.5	23.10	29.00
Granular muriate, min. 60% K ₂ O	39.6	23.76	29.65

^(a) Assumes 60% K₂O content

Source: Canadian Minerals Yearbook, 1963

Prices of potassium chloride of higher purity than the fertilizer grade are ordinarily quoted for carload lots, at the producer's works. The chemical grade is specified as containing a minimum of 99.95 per cent of potassium chloride. The potassium chloride of even higher purity, which is available for use as a reagent and in pharmaceutical products, is much more expensive than the chemical grade. For example, in April 1965, the quoted price for the chemical grade in bulk was \$33 a ton; at the same time the U.S.P. crystals, in drums, were priced at 17½ cents a pound, equivalent to \$350 a ton and the U.S.P. powder, in drums, was equivalent to about \$500 a ton. Prices in the U.S.A. of the fertilizer and chemical grades are shown below.

Prices of Potassium Chloride, in the U.S.A.,
Carload Lots, Bulk at Works, 1959-64

<u>Year</u>	<u>Potassium Muriate (Chloride) Standard</u>		<u>Chemical Grade</u>
	<u>Per Unit-ton</u>	<u>Per ton 60% K₂O</u>	<u>99.95% KCL</u>
	U.S. dollars		\$ U.S. per ton
1959	.30 - .345	18.00 - 20.70	29.00
1960	.33 - .345	19.80 - 20.70	28.00 - 29.00
1961	.35 - .375	21.00 - 22.50	29.00 - 31.00
1962	.35 - .37	21.00 - 22.20	31.00
1963	.37 - .40	22.20 - 24.00	31.00
1964	.36 - .40	21.60 - 24.00	31.00 - 33.00

Source: Oil, Paint and Drug Reporter

Foreign Trade

Until 1962 Canada was dependent on imports for supplies of potassium chloride, except for 1959 when Canada produced an estimated 59,000 tons. Imports reached their peak in 1961, the year before I.M.C. brought its Saskatchewan operation into production. In that year 170,000 tons valued at \$4.4 million were imported. Imports have declined in each year since then and in 1964 were 67,000 tons valued at two million dollars.

Imports of Potassium Chloride, by Principal Country of Origin, Selected Years, 1953-64

	<u>France</u>	<u>West Germany</u>	<u>U.S.S.R.</u>	<u>Total Europe</u>	<u>U.S.A.</u>	<u>Total Imports</u>	
						'000 tons	\$'000
		-	thousand tons	-			
1953	29	25	-	54	66	121	2,914
1955	30	37	-	66	70	138	3,231
1957	24	36	-	60	76	137	3,406
1959	16	19	5	41	55	95	2,282
1960	17	29	6	51	89	147	3,382
1961	24	33	5	63	107	170	4,402
1962	22	25	13	60	88	148	4,367
1963	14	10	13	37	38	74	2,096
1964	9	8	7	24	43	67	1,955

Source: D.B.S., Trade of Canada, Imports, s.c. 8155

Almost all imports of potash are normally entered in provinces east of Manitoba. Those entered in British Columbia are relatively small and almost none is entered in the Prairie Provinces. All imports from Europe enter in the Atlantic Provinces and Quebec; the bulk of imports from the U.S.A. are entered in Ontario.

Imports of Muriate of Potash, by Region of Entry, Selected Years, 1958-63

	<u>Atlantic Provinces</u>	<u>Quebec</u>	<u>Ontario</u>	<u>British Columbia</u>	<u>Canada</u>
		-	thousand tons	-	
1958	29	29	68	5	131
1960	36	29	73	8	147
1961	33	55	73	8	170
1962	32	34	73	9	148
1963	22	15	34	3	74
1964	..	..	..	..	67

Source: D.B.S., s.c. 8155, s.c. 41652

In 1964 estimated exports were about six times as large as total Canadian consumption, and as new production facilities are brought into operation Canadian consumption will become an even smaller fraction of exports. In spite of this, it is probable that Canada will continue to import fairly substantial amounts of potassium chloride. Costs of freight from Saskatchewan to eastern Canadian destinations are high relative to the value of the product, and the laid-down cost of imported potash in some parts of the Central and Atlantic provinces will probably continue to be less than that of the Saskatchewan potash. Moreover, the chemical grade is not made in Canada.

Canadian export statistics do not show potassium chloride separately. However a large proportion of the exports is to the U.S.A.; U.S. data show that Canadian exports to that country were 76,400 tons valued at \$1.6 million in 1962; 563,000 tons valued at \$13 million in 1963 and 837,357 tons valued at \$19.4 million in 1964. Canada also shipped potassium chloride to a number of other countries in 1963 and 1964 including, for example, Britain, Brazil and Japan. Exports to Japan were particularly large, being valued at \$6.5 million in 1963 and \$8.1 million in 1964. In total, exports to countries other than the U.S.A. were approximately 350,000 tons in 1963 and 450,000 tons in 1964.

The Canadian Minerals Yearbook, 1963, reviews the outlook for the Canadian potash industry in the following terms:

"Because of the small size of the domestic market ... the development of the Canadian potash industry depends on its ability to export in competition with other sources throughout the world ...

"Canadian potash will have some competitive advantage in the large nearby market south of the Great Lakes, and in the expanding markets in Japan and other Pacific basin countries. Other markets in the United States and throughout the world appear to be attainable in spite of more serious competition from established producers."

Tariff Considerations

Potassium chloride, in the grades that would ordinarily be used for agricultural purposes, is entered under tariff item 209.

<u>Item 209</u>	<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
Potash, muriate and sulphate of, crude; saltpetre or nitrate of potash.....	Free	Free

The less concentrated, crude forms such as kainite, German potash salts and German mineral potash are entered under item 662, also free of duty under both the B.P. and M.F.N. Tariffs.

The forms of potassium chloride which would be sufficiently pure to be described as "chemical" grade or which would meet the specifications of the U.S. Pharmacopoeia were entered under item 208t, Free, B.P. and 15 p.c., M.F.N. until July 3, 1962, when temporary item 209e, "potassium chloride", was established, duty-free, B.P. and M.F.N.

The very pure materials would not ordinarily be used for the manufacture of fertilizers because of their cost. However, all forms of potassium chloride could be entered under tariff item 663b when imported for use in the manufacture of fertilizers.

In the Brussels Tariff Nomenclature crude natural potassium salts such as carnallite, kainite and sylvinite are classified under heading 31.04. This heading also includes potassium chloride whatever its degree of purity. Thus, insofar as heading 31.04 relates to potassium chloride, it covers the forms of the product which would be entered under tariff items 209, 209e and 662.

The Canadian Federation of Agriculture listed potassium chloride as a constituent of fertilizers and requested continued free entry for materials and chemicals used in the manufacture of fertilizers, and supported rates of Free, B.P. and 5 p.c., M.F.N., for chemicals used as fertilizers, that is, maintenance of the rate provisions of tariff items 662, 663 and 663b.⁽¹⁾

Only one company, Consolidated Mining and Smelting Company of Canada Limited, made representations to the Board relating specifically to the forms of potassium chloride entered under item 209 and expressed this interest principally in terms of fertilizer use. The company proposed continued free entry under both the B.P. and M.F.N. Tariffs.⁽²⁾

In support of continued free entry for the less pure potassium chloride entered under item 209, the spokesman for Cominco said:

"The present tariff schedule provides for free entry of potassium chloride under tariff item 663b, because it is imported for use exclusively in the manufacture of fertilizers, and provides for free entry under tariff item 209. Imposition of a duty on potassium chloride would not serve the best interests of the Canadian economy because it would add to the cost of the company's manufacture of fertilizers, of which the major part is sold for export in a highly competitive market."⁽³⁾

The company spokesman also referred to the possibility of retaliatory action on the part of countries which might be affected by the imposition of a duty on potassium chloride entering Canada.

⁽¹⁾ Transcript, Vol. 83, p. 12814

⁽²⁾ Same, Vol. 21, p. 3107

⁽³⁾ Same, Vol. 21, p. 3106

Although the discussion appeared to be involved mainly with the use of potassium chloride for the manufacture of fertilizers, the spokesman indicated his company's interest in the use of potassium chloride for the manufacture of potassium hydroxide and proposed free entry under both the B.P. and M.F.N. Tariffs, without qualification as to the product's made-in-Canada status.⁽¹⁾

Several consumers of the purer grades of potassium chloride also made representations to the Board. One of these, Polymer Corporation, informed the Board that it favoured free entry under all Tariffs, in an end-use item like existing item 851, when the product was imported for use in the manufacture of synthetic rubber.⁽²⁾

Another company, the Electric Reduction Company of Canada Limited, proposed that the then current rates of Free, B.P. and 15 p.c., M.F.N., under item 208t, remain unchanged.⁽³⁾ Erco described the product which it imported as "technical grade, 99.7 per cent potassium chloride." Erco qualified its proposal to apply until the product was produced in Canada; at that time it proposed rates of 15 p.c., B.P. and 20 p.c., M.F.N.

C.I.L. urged free entry under both the B.P. and M.F.N. Tariffs, until the product was made in Canada. When it is made in Canada, the company supported rates of 15 p.c., B.P. and 20 p.c., M.F.N.⁽⁴⁾

The Canadian Pharmaceutical Manufacturers Association listed potassium chloride as a chemical of minor importance to its members and in a general proposal urged rates of Free, B.P. and 15 p.c., M.F.N., unless otherwise provided, for chemicals when used in the manufacture of pharmaceuticals, until they are made in Canada.⁽⁵⁾ The interest of the Association would probably be in the very pure, U.S.P. grade.

Thus, except for end-use interests, there were three proposals before the Board concerning the relatively pure forms of potassium chloride. Cominco and C.I.L. proposed free entry under both the B.P. and M.F.N. Tariffs, the latter company limiting the application of its proposal until the product is made in Canada, after which the company would support rates of 15 p.c., B.P. and 20 p.c., M.F.N. Erco proposed continuation of the then existing rates, under item 208t, of Free, B.P. and 15 p.c., M.F.N. Erco's proposal also applies only until the product is made in Canada and supported rates of 15 p.c., B.P. and 20 p.c., M.F.N., thereafter.

The relatively pure grades of potassium chloride have always been imported, and this situation is likely to continue. The available evidence indicates that all imports of the chemical grade have been from the U.S.A. and that the U.S.A. will probably continue to be the source of the material. Therefore only the M.F.N. Tariff is, or is likely to be, significant for imports of the product.

(1) Transcript, Vol. 21, p. 3107

(2) Same, Vol. 20, p. 2892; Vol. 89, p. 13501

(3) Same, Vol. 21, p. 3082

(4) Same, Vol. 21, p. 3102-3

(5) Same, Vol. 87, p. 13321

In discussing C.I.L.'s proposal that free entry should be provided only until the product was ruled to be made in Canada, the company spokesman did not say what rates of duty he thought would be appropriate at that time. He did state that he expected that the producer might request rates of 15 p.c., B.P. and 20 p.c., M.F.N., but did not indicate why he thought such a proposal would be forthcoming. Neither C.I.L. nor the Industry Committee, whose proposal is noted below, indicated why rates of 15 p.c., B.P. and 20 p.c., M.F.N., would be appropriate when the chemical grade was ruled made in Canada.

The Electric Reduction Company considered that even when a product is not produced in Canada, the country benefits from imposing and collecting a duty on its entry. On the other hand, both C.I.L. and Cominco contended that such a duty would increase their costs of producing potassium hydroxide and would adversely affect their ability to compete with foreign producers.

In early 1964, the price of potassium chloride, 99.95 per cent pure, in bulk, f.o.b. Carlsbad, New Mexico, was \$U.S. 31 or about \$Can. 33.48. A duty of 15 per cent at this price would amount to \$5.02 per ton of potassium chloride as the additional cost to purchasers arising out of the tariff, at least so long as there is no Canadian production. As indicated in the discussion on potassium hydroxide, the hydroxide would tend to bear all of this additional cost. Because about 1,200 pounds of potassium chloride are needed to produce one ton of potassium hydroxide, 45 per cent solution, the proposed duty would add about \$3 per ton to the cost of producing potassium hydroxide. Almost all of the potassium hydroxide which is imported is now entered free of duty under tariff item 209a(1).

C.I.L.'s expectation that any future producer of the refined grades of potassium chloride in Canada would request rates of duty of 15 p.c., B.P. and 20 p.c., M.F.N., did not appear justified to the spokesman for the Consolidated Mining and Smelting Company. He pointed out that the initial production of the agricultural grade, which was planned in Saskatchewan, envisaged an exportable surplus of 500,000 tons annually out of a total output of 600,000 tons. He also indicated that the market for a large part of this surplus was likely to be in the U.S.A., and that in consequence the producers in Canada were unlikely to risk retaliatory action by requesting that duties be imposed on imports of the relatively small volume of refined potassium chloride entering Canada from the U.S.A.

Current information indicates that production of potassium chloride in Saskatchewan already exceeds an annual rate of 1,000,000 tons. With an indicated use in Canada of about 200,000 tons, Canada is already exporting about 85 per cent of its production. This lends support to the statement by the spokesman for Cominco that,

"They [the producers in Canada] are going to depend largely on the United States market, and that is a point we are going to emphasize here, that they are very unlikely to ask for a tariff into Canada in view of the dependence on the United States market for exports."(1)

(1) Transcript, Vol. 21, p. 3113

By 1962, after a substantial expansion in the use of the chemical grade, the market for potassium chloride chemical grade was estimated to be less than 5,000 tons annually, with little likelihood of substantial growth in the near future. According to the evidence and information from one of the major producers of the product, the foreseeable demand for the chemical grade is unlikely to be sufficient to warrant its production in Canada.

None of the proposals by the companies dealt specifically with the re-wording of the items for potassium chloride in terms of the Brussels Nomenclature. However, none of them seemed opposed to the general proposal by the Industry Committee for such re-wording. Certain interests, as noted above, favoured the continuation of end-use provisions.

In the Brussels Tariff Nomenclature potassium chloride is excluded from the general provision for chlorides under heading 28.30. Even in the pure state it is classified with fertilizers under heading 31.04 or 31.05. Heading 31.05 refers (among other matters) to mixtures of materials and to materials in packages whose gross weight does not exceed 10 kilogram (22.05 pounds). Heading 31.04 is that under which potassium chloride as a single product and in larger packages is classified. Heading 31.04 would apply to almost all of the potassium chloride entering commercial trade. Thus, as indicated earlier, B.T.N. heading 31.04 would provide for the products which may now be entered under tariff items 209, 209e and 662.

Some representations were made principally in terms of the existing Customs Tariff, others in the context of the B.T.N. classification. The Industry Committee set up a suggested form of proposal which, to some extent, provided for these various representations.

The Industry Committee suggested a provision under B.T.N. heading 31.04 for separate chemically defined compounds when they are not used as fertilizers or for the manufacture of fertilizers.⁽¹⁾ The effect of this would be to make potassium chloride, regardless of its purity, subject to one set of rates if imported for use as a fertilizer or for the manufacture of fertilizers, and subject to another set of rates if imported for other purposes.

At the public hearing in January 1961, the Electric Reduction Company of Canada Limited (Erco) referred to the grade which it used as being a minimum of 99.7 per cent potassium chloride;⁽²⁾ C.I.L. said the grade it used contained a minimum of 99.9 per cent potassium chloride.⁽³⁾ In addition, The Oil, Paint and Drug Reporter, in the U.S.A., has published prices for a grade which contains 99.3 per cent potassium chloride and which might also be entered as a refined form of potassium chloride, under item 209e.

Because both Erco and C.I.L. specified a minimum potassium chloride content for the products to which their proposals were related, potassium chloride less than 99.7 per cent pure, if imported for other than fertilizer use, would by the Industry Committee's general proposal

(1) Transcript, Vol. 81, p. 12312 and following

(2) Same, Vol. 21, p. 3084

(3) Same, Vol. 21, p. 3092

be subject to rates of 15 p.c., B.P. and 20 p.c., M.F.N., under an item like B.T.N. heading 31.04. The Committee's proposal was to apply to chemicals for which no other recommendations were made to the Board and therefore to potassium chloride less than 99.7 per cent pure, if not covered by a fertilizer proposal.

If the Industry Committee's amendments were adopted and a material containing less than 99.7 per cent potassium chloride became useable in processes for which the present relatively very pure grades are used, Canadian consumers might be deterred from its use by the duty of 15 or 20 p.c., even though the grade was not manufactured in Canada at that time. The grades of very high purity would, of course, continue to be entered free of duty until ruled to be produced in Canada under the proposals of C.I.L. and Erco, if these were implemented.

The Industry Committee did not indicate why rates of 15 p.c., B.P. and 20 p.c., M.F.N. were appropriate specifically for potassium chloride less than 99.7 per cent pure nor, when made in Canada, for potassium chloride regardless of purity, and in particular why the B.P. rate was needed. The proposed rates were those proposed generally by the Committee for headings and for residual provisions.

POTASSIUM SULPHATE

Potassium sulphate is used in Canada almost entirely as a fertilizer or for the manufacture of mixed fertilizers. It is valued for its potassium content and it is sometimes used in place of potassium chloride partly because it is preferred for crops which have less tolerance for the latter form of potassium. Other uses are relatively minor and include the production of other potassium salts and as a laboratory reagent. As with other potassium products used in fertilizers, the degree of concentration is given in terms of potassium oxide (K_2O) content. The term "potash" is frequently applied to potassium sulphate as well as to potassium chloride.

Potassium sulphate may be produced by refining mineral ores; it is also readily produced by the reaction of potassium chloride and sulphuric acid which yields potassium sulphate and hydrochloric acid.

The available information indicates that relatively pure potassium sulphate is produced in Canada, but that the fertilizer grade is not available from Canadian production. Canadian supplies of the fertilizer grade are imported mainly from the U.S.A., France and Western Germany. Between one-half and two-thirds of the imports originate in the U.S.A.

Canadian imports reached a peak in 1961 of more than 26,000 tons, valued at slightly more than \$1,000,000. They declined thereafter and in 1964 were 20,000 tons valued at \$825,000. The decline coincides with the development of the potash deposits in Saskatchewan. However, as was pointed out in the section of the report dealing with potassium chloride, costs of overland transportation to provinces east of Manitoba, where most Canadian use of potassic fertilizers occurs, are high, and Eastern Canada will probably continue to import large quantities of such fertilizers. Moreover, potassium sulphate will continue to be used for certain crops.

Imports of Potassium Sulphate, by Country of Origin,
Selected Years, 1953-64

	<u>France</u>	<u>Western Germany</u>	<u>U.S.A.</u>	<u>Total Imports</u>	
	-	thousand tons	-	'000 tons	\$'000
1953	3.0	1.2	8.6	12.8	458
1955	2.0	1.6	10.3	14.0	459
1957	6.4	0.2	11.1	17.7	610
1959	6.1	4.1	14.5	24.7	815
1961	9.1	0.1	17.3	26.5	1,023
1962	8.3	0.5	15.1	24.0	957
1963	5.1	-	13.8	18.9	758
1964	4.4	-	12.0	19.6	825

Source: D.B.S., Trade of Canada, Imports, s.c. 8156 and s.c. 41657

In addition to the potassium sulphate tabulated above, small amounts of refined material appear to be imported. In 1960, the latest year for which data are available, imports of the refined product were valued at about \$9,000. However, the great bulk of the Canadian use of potassium sulphate is in the production of mixed fertilizers and consumption by this industry accounts for most imports. Most of the remainder is for direct application to the soil.

Sales of Potassium Sulphate for Direct Application and for the
Manufacture of Mixed Fertilizers and Miscellaneous Chemicals,
1957-64

	<u>Direct Application</u> (a)	<u>For Mixed Fertilizers</u>	<u>Misc. Chemicals</u>	<u>Total Accounted</u>
		- tons -	-	
1957	848	13,906	6	14,760
1958	597	17,124	4	17,725
1959	745	20,576	2	21,323
1960	1,043	19,347	3	20,393
1961	1,389	23,254	-	24,643
1962	1,529	22,463	..	23,992
1963	1,928	..	..	..
1964	2,004	..	..	..

(a) Crop years ended June 30

Source: D.B.S., Various publications

Potassium sulphate agricultural grade, like potassium chloride, is sold on the basis of its K₂O (potassium oxide) content. Pricing in the U.S.A. is on a "unit-ton" basis, for a material with a minimum of 50 per cent K₂O, per ton. One unit-ton is one ton of one per cent K₂O content. For example, in August, 1964, the published price in the

U.S.A. for the material containing a minimum of 50 per cent K_2O was 70 cents a unit ton. If the product contained only 50 per cent K_2O the actual price would be \$35 a ton.

The refined product, which is more than 99 per cent pure and contains about 54 per cent K_2O , was much more expensive, being 17 cents a pound for the powder, 18 cents a pound for the granular material and 31 to 33 cents a pound for the crystals. At 18 cents a pound, the price of the granular material would be \$360 a ton, more than ten times the price of the fertilizer grade. The average value per ton of Canadian imports indicates that it is the agricultural grade which is imported.

Tariff Considerations

Crude potassium sulphate is entered under tariff item 209; the refined product is entered as an unenumerated chemical under item 711. In addition, both the crude and refined product may be entered under end-use item 663b, if for use in the manufacture of fertilizers. The rates of duty that apply to these tariff items are given below.

<u>Item</u>	<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
209	Free	Free
663b	Free	Free

The tariff items listed above are within the terms of Reference 120, and the volume and value of the trade in the product indicate that there must be a considerable commercial interest in the product. Nevertheless, no formal submissions were made to the Board relating specifically to the chemical, other than a submission by the Industry Committee which dealt with various aspects of classification.

Except for two associations which expressed end-use interests, the chemical was not specifically mentioned at other hearings. The Canadian Pharmaceutical Manufacturers Association informed the Board that potassium sulphate was a chemical of relatively small economic importance to its members and supported rates of 15 p.c., B.P. and 20 p.c., M.F.N., for chemicals which are made in Canada and are used in the manufacture of pharmaceuticals.⁽¹⁾ Presumably the pharmaceutical manufacturers' interest would be in the very pure product that is entered under item 711 at those rates and which would be classified under heading 28.38 of the B.T.N. The Association did not indicate why these rates were appropriate specifically for potassium sulphate.

⁽¹⁾ Transcript, Vol. 87, p. 13321

The Canadian Federation of Agriculture expressed an interest in potash (potassium sulphate) as a material used in fertilizers. The Federation urged that the provisions of the existing tariff items which apply to fertilizers should be continued.⁽¹⁾ The representations of the Federation are dealt with in the part of the report dealing with fertilizers in general.

In the Brussels Tariff Nomenclature, potassium sulphate is classified under heading 28.38 if it contains in the dry state more than 52 per cent potassium oxide (K_2O). If it contains 52 per cent or less of K_2O , it is classified under heading 31.04, if in packages whose gross weight exceeds 10 kilogrammes (22.05 pounds), and under heading 31.05 if in packages whose gross weight is 10 kilogrammes or less. Pure potassium sulphate contains the equivalent of 54.02 per cent K_2O . The product containing 52 per cent K_2O equivalent is 96.2 per cent pure.

The potassium sulphate which is imported into Canada is used almost entirely as a fertilizer or for the manufacture of fertilizers. In view of the very great difference in cost between the agricultural material (about \$38 a ton) and the chemical grades (\$360 to \$660 a ton) it is most unlikely that the purer grades would be used for fertilizers. The average value of imports confirms this view. Thus it appears that all or almost all of the potassium sulphate that enters Canada is of the agricultural grade and contains at least 50 per cent but probably not more than 52 per cent of potassium sulphate. Such a product would be classified under B.T.N. heading 31.04 or 31.05.

Except for end-use items, potassium sulphate of a 99 per cent purity is classified in tariff item 711 and that of lesser purity, in tariff item 209. In the Brussels Nomenclature potassium sulphate of a 96.2 per cent purity is classified in heading 28.38 and that of lesser purity, in heading 31.04 or 31.05. It can therefore be said that when the product is at least 99 per cent pure it is classified in tariff item 711 and in Brussels heading 28.38; between 96.2 per cent and 99 per cent purity, in tariff item 209 and Brussels heading 28.38; when of lesser purity, in tariff item 209 and Brussels heading 31.04 or 31.05.

Thus, if the B.T.N. were adopted for classification of fertilizers and chemicals and potassium sulphate was excluded from the provisions of item 209, potassium sulphate more than 96.2 per cent pure would be classified under heading 28.38 and any material of lesser purity would be under heading 31.04 or 31.05.

Under the existing tariff items that apply to potassium sulphate, practically all of the product that is imported is entered free of duty under both the B.P. and M.F.N. Tariffs, under tariff item 209 or 663b. During the ten years, 1954 to 1963, only in 1960, 1962 and 1963 were any dutiable imports reported, and these were of small amounts. Duty-free imports in that period, 1954-63, exceeded \$7,000,000 in value. Although most of the imports are known to have been for use in the manufacture of fertilizers, some were also used by the chemical industry.

(1) Transcript, Vol. 83, p. 12813-4

The Industry Committee took the general position that products for which rate proposals were not submitted by others should be dutiable at 15 p.c., B.P. and 20 p.c., M.F.N. Because the only rate proposals made to the Board related to end-use interests, the Committee's proposal of 15 p.c., B.P. and 20 p.c., M.F.N. would apply to potassium sulphate, regardless of purity, if for any use other than as a fertilizer or in the manufacture of fertilizers. The spokesman for the Committee gave no indication why these rates would be suitable specifically for potassium sulphate.

As indicated earlier, potassium sulphate, like potassium chloride, is valued for its potassium content and is sold on the basis of its potassium content, specified in terms of potassium oxide equivalence. Although the crop and the nature of the soil affect the choice of the source of potassium, in general the pattern of use and trade is similar and to a degree the products are substitutes for each other.

The development of Canada's potash (potassium chloride) resources is continuing at a rapid rate. The Canadian Minerals Yearbook, 1962, states:

"During the next seven years, up to 1970, it is expected that five or six large projects will be in operation involving a total capital outlay of possibly \$275 million and capable of producing annually six million tons of end-product valued at \$120 million. The combination of large rich deposits, strong aggressive producers and increasing demand for the product forecasts a healthy and important potash industry for Canada."

In 1964 exports were around 90 per cent of output and were valued at about \$30 million. Therefore the Canadian interest with respect to trade in potash would be best served by low tariffs on the product in importing countries. At the hearing on potassium chloride, Consolidated Mining and Smelting Company of Canada Limited referred to the possibility of retaliation by other countries, particularly the U.S.A., if Canadian rates on imports of potash were increased.⁽¹⁾ Between one-half and two-thirds of Canada's imports of potassium sulphate are from the U.S.A.

The Industry Committee's classification and rate proposals would affect the rates on only a very small part of Canadian imports. The available information suggests that, in 1963, at most, imports valued at about \$35,000 might have been affected, out of total imports valued at \$758,000.

MAGNESIUM SULPHATE - POTASSIUM SULPHATE

Magnesium sulphate - potassium sulphate (potassium magnesium sulphate, sulphate of potash magnesia) is a crystalline double salt whose only known use in Canada is as a fertilizer ingredient. It is available commercially in a form which contains the equivalent of 40 per cent of potassium sulphate and 55 per cent of magnesium sulphate.

(1) Transcript, Vol. 21, p. 3106

In this form it contains approximately 28 per cent potassium oxide (K_2O). The material which enters commercial trade in North America is listed as containing 22 per cent K_2O .⁽¹⁾ It is not known to be made in Canada; supplies are imported, mainly from the U.S.A.

Imports of Sulphate of Potash Magnesia, by
Country of Origin, 1958-64

	<u>Western Germany</u>		<u>U.S.A.</u>		<u>Total</u>	
	tons	\$'000	tons	\$'000	tons	\$'000
1958	400	11	2,728	50	3,128	61
1959	-	-	4,451	72	4,451	72
1960	500	12	5,064	68	5,564	80
1961	300	8	4,880	76	5,180	84
1962	775	23	4,967	87	5,742	110
1963	-	-	4,748	83	4,748	83
1964	-	-	6,203	106	6,203	106

Source: D.B.S., Trade of Canada, Imports, s.c. 8164

Most of the Canadian use is in the manufacture of mixed fertilizers; relatively small amounts are sold for direct application to the soil. Canadian consumption, and therefore imports, have been between 4,700 and 6,200 tons annually in recent years, with a value of about \$90,000. About 80 per cent of the total has been used in the manufacture of mixed fertilizers.

In the U.S.A. the material is sold in a form that contains 40 per cent of potassium sulphate and 55 per cent of magnesium sulphate and has a K_2O content of 22 per cent. For carloads, published prices in April, 1965, were \$16.25 to \$18.25 per ton, for the material in bulk and \$22.60 to \$24.60 for the bagged material, at works. In 1962 and 1963, the average value of sulphate of potash magnesia entered into Canada was \$17.56 and \$17.55, respectively, per ton. This indicates that most Canadian imports were of the material in bulk.

Tariff Considerations

Potassium magnesium sulphate is entered under tariff item 208t at rates of Free, B.P. and 15 p.c., M.F.N. If entered for direct application to the soil it would be classified as a manufactured or compounded fertilizer, under item 663, at rates of Free, B.P. and 5 p.c., M.F.N., and if imported for use in the manufacture of mixed fertilizers it would be free of duty under all Tariffs, under item 663b.

In the Brussels Tariff Nomenclature the material would be classified under heading 28.48 if it contained more than 30 per cent by weight of potassium oxide, and under heading 31.04 (or 31.05) if it

⁽¹⁾ Canadian Minerals Yearbook 1963, Potash

contained 30 per cent or less by weight of potassium oxide. It seems clear, from the available information, that most or all of the material that is imported into Canada is of a kind which would contain less than 30 per cent by weight of potassium oxide and therefore would be classified by heading 31.04.

The representations which were made to the Board with respect to fertilizers in general would affect the classification and rates for magnesium sulphate - potassium sulphate. Such representations are dealt with in the earlier general discussion of fertilizers. This discussion would also apply to the proposals of the Canadian Federation of Agriculture, which expressed an interest in the material as a fertilizer or in the manufacture of fertilizers.

No representations were made to the Board related specifically to potassium magnesium sulphate, apart from the interest expressed by the Federation of Agriculture. As a result, the product, when containing more than 30 per cent of potassium oxide, would be subject to the Industry Committee's general proposal for products of heading 28.48 for which no other proposals were made, namely rates of 15 p.c., B.P. and 20 p.c., M.F.N., in an item worded like heading 28.48 of the B.T.N.

As in the case of potassium sulphate, the Committee's representations at the hearing in May, 1962, were for adoption of the B.T.N. criteria for classification either under heading 28.48 or 31.04. The effect of the Committee's proposals would be that when imported for other than fertilizer use, the product would be dutiable at 15 p.c., B.P. and 20 p.c., M.F.N., instead of at the existing rates of Free, B.P. and 15 p.c., M.F.N., under item 208t. The data indicate that all imports are for use in the manufacture of mixed fertilizers or for direct application to the soil and would, therefore, be entered under item 663b, free of duty under both the B.P. and M.F.N. Tariffs, or under tariff item 663, at rates of Free, B.P. and 5 p.c., M.F.N.

OTHER PRODUCTS OF HEADING 31.04

In addition to the products of B.T.N. heading 31.04 which have been discussed in the foregoing, the heading also applies to crude potassium salts obtained from residues of beet molasses; crude, natural potassium salts such as kainite and sylvinit and to fertilizers which consist of mixtures of any of the individual products of heading 31.04, mixed together, if of a kind used as fertilizers. There is practically no information available regarding any of the above.

Tariff item 662 which specifies free entry under all Tariffs, provides for kainite, German potash salts and German mineral potash and would therefore probably include most of the crude, natural potassium salts of heading 31.04. The mixtures would be classified under tariff item 663 as manufactured or compounded fertilizers, if entered for direct application to the soil. The potassium salts obtained from beet molasses would also probably be entered under item 663 if for direct use as a fertilizer. The rates under tariff item 663 are Free, B.P. and 5 p.c., M.F.N. All of the above would be entitled to entry under item 663b, when imported for use in the manufacture of mixed fertilizers, with free entry under both the B.P. and M.F.N. Tariffs.

The crude, natural potassium salts would be classified under item 662 regardless of their intended use. However, if imported for other than fertilizer use, the crude potassium salts obtained from beet residues would probably be classified under item 711, with rates of 15 p.c., B.P. and 20 p.c., M.F.N. and the mixtures might be classified under tariff item 220a(i) at rates of 15 p.c., B.P. and 20 p.c., M.F.N.

No representations were made to the Board related specifically to the various products which are the subject of the present discussion. However, the representations which dealt with the general subject of fertilizers and materials used in the manufacture of fertilizers would apply to them; these representations are discussed in an earlier part of this report.

OTHER FERTILIZERS - B.T.N. 31.05

INTRODUCTION

Heading 31.05 of the Brussels Tariff Nomenclature is the residual heading of the chapter relating to fertilizers. It provides for single fertilizer compounds which contain two or more of the three fertilizer ingredients, for example ammonium phosphates, which contain both nitrogen and phosphoric acid; it also provides for mixtures whether mechanical or chemical or both, which contain two or more of the three ingredients; and for all other fertilizers which are not included in another heading, except for separate chemically defined compounds and certain materials which are provided for elsewhere and are specifically excluded from chapter 31. Heading 31.05 also relates to any of the goods of headings 31.01, 31.02, 31.03 and 31.04 if put up in tablets, lozenges or similar prepared forms or in packings of a gross weight not exceeding ten kilogrammes (22.05 pounds).

The function of heading 31.05 in the chapter is apparent when seen in relation to the other headings.⁽¹⁾

- 31.01 Guano and other natural animal or vegetable fertilisers, whether or not mixed together, but not chemically treated
- 31.02 Mineral or chemical fertilisers, nitrogenous
- 31.03 Mineral or chemical fertilisers, phosphatic
- 31.04 Mineral or chemical fertilisers, potassic
- 31.05 Other fertilisers

- (A) Ammonium phosphates containing not less than six milligrammes of arsenic per kilogramme, whether or not for use as fertilisers.

⁽¹⁾ Abstracted from the Explanatory Notes, 1955, Vol. 1, p. 305-9

(B) Composite and complex fertilisers (other than separate chemically defined compounds) ...

They are obtained by:

1. Mixing together two or more fertilising products (even if those products, taken alone, are not classified in headings 31.02 to 31.04).
2. Chemical processes.
3. Both mixing and chemical processes.

(C) All other fertilisers (other than separate chemically defined compounds), for example:

1. Natural animal or vegetable fertilisers chemically treated ...
2. Compost ... treated with lime, calcium cyanamide, etc.
3. Certain industrial wastes such as wool scouring residues, etc.
4. Mixtures of fertilising substances (i.e., those containing nitrogen, phosphorus or potassium) with non-fertilising substances e.g., sulphur ...
5. Natural potassic sodium nitrate fertiliser, a natural mixture of sodium nitrate and potassium nitrate.

If they were imported for direct application to the soil all of the goods included in heading 31.05 would be entitled to entry under tariff item 663, as manufactured or compounded fertilizers, with rates of Free, B.P. and 5 p.c., M.F.N. If entered for use in the manufacture of fertilizers all of them could be entered under item 663b, free of duty under both the B.P. and M.F.N. Tariffs.

The materials which are classified under heading 31.05 would be purchased almost exclusively for use as fertilizers or fertilizer ingredients and, therefore, for these materials, heading 31.05 and tariff items 663 and 663b would correspond. However, the goods which are classified under heading 31.05 are so classified whether or not for use as fertilizers; on the other hand tariff items 663 and 663b relate only to specific end-uses. For example, ammonium phosphates would be entered under tariff item 663b if imported for use in the manufacture of fertilizers, but probably under item 218 if imported for some other purpose. Under item 663b entry is free under both the B.P. and M.F.N. Tariffs; under item 218 the rates are Free, B.P. and 25 p.c., M.F.N. A similar situation might arise with some of the other goods classified under heading 31.05.

The available statistics are not sufficiently detailed to permit an analysis of most of the goods which are under heading 31.05. In what follows, the ammonium phosphates, the ammonium nitrate phosphates (mixtures of ammonium nitrate and ammonium phosphate) and the

mixed fertilizers, are discussed separately. The other products are discussed only in very general terms because of the lack of more detailed information. Much of the previous discussion of fertilizers in general would apply to a large extent to the goods of heading 31.05.

AMMONIUM PHOSPHATES - B.T.N. 31.05 AND 28.40

The Product and the Industry

Two forms of ammonium phosphate are important in Canadian commerce, ammonium dihydrogen orthophosphate (ammonium phosphate monobasic) and diammonium hydrogen orthophosphate (ammonium phosphate dibasic). By far the more important of the two is the monobasic form which is used mainly as a fertilizer or in the manufacture of mixed fertilizers. The fertilizer grade of ammonium phosphate monobasic generally also contains some of the dibasic form, and the ratio of the two is varied to obtain particular results. For applications for which a mixture of the mono- and dibasic forms is unsuitable, the products are available in much purer forms as the technical or National Formulary grades of the single chemicals.

The monobasic fertilizer grade is available commercially as "ammonium phosphate, 11-48-0". The first figure designates the percent of nitrogen contained; the second figure pertains to the percentage of phosphorus in terms of phosphorus pentoxide (P_2O_5); and the third figure relates to the percentage of potassium oxide (K_2O) contained. Dibasic ammonium phosphate, fertilizer grade, is usually designated as 18-46-0. The total nitrogen and phosphorus content and the ratio of each to the other is varied by using different combinations of phosphate rock and sulphuric acid in the production process to achieve the desired result.

As indicated above, the ammonium phosphates that are used as fertilizers are mixtures of the mono- and dibasic forms whereas the grades which are used for other purposes contain only one form. That the fertilizer and technical grades are significantly different may be illustrated by their prices. In April 1965, in the U.S.A., the fertilizer grade of the dibasic form, 18-46-0, in bulk, was priced from \$75.50 to \$78.75 a ton, f.o.b. plant; at the same time the dibasic form, technical grade, in bags was quoted at \$192 a ton f.o.b. plant, and the purified, National Formulary grade, at 46 cents a pound, in drums, or the equivalent of \$920 a ton. The more refined forms of ammonium phosphate are not produced in Canada.

At the time of the hearing on ammonium phosphate in 1961, the fertilizer grades of ammonium phosphate were known to be produced in Canada by three companies, at four plants. Only one producer was located east of Alberta, Cyanamid of Canada Limited, at Niagara Falls, Ontario. The other two companies were Consolidated Mining and Smelting Company of Canada Limited (Cominco) with plants at Trail and Kimberley, British Columbia, and Northwest Nitro Chemicals Limited, at Medicine Hat, Alberta. Cominco was by far the largest producer of ammonium phosphates in Canada. The production by Cyanamid, in Ontario, was a very small part of the Canadian total.

In February, 1961, Cominco reported that the combined capacity of its Trail and Kimberley plants was 345,000 tons of ammonium phosphate annually. Since that date the company has built additional production facilities at Kimberley, B.C. and at Regina, Saskatchewan which, it is reported, will add about 200,000 tons to its annual capacity. Sherritt Gordon Mines Limited has announced the establishment of a plant at Fort Saskatchewan, Alberta, with a capacity of about 120,000 tons per year, Cyanamid is reported to have plans for expansion of production capacity at Niagara Falls, and Western Co-operative Fertilizers Limited has begun operating a new plant at Saskatoon, Saskatchewan. By 1965, Canadian productive capacity is expected to be about three-quarters of a million tons, annually.

The Market

The available information suggests that in 1963 Canadian production of ammonium phosphates was about 400,000 tons with a value of approximately \$30 million, an increase of around one-third since 1958, five years previously. It appears that the pattern of domestic sales in 1964 was similar to that of other recent years; about 300,000 tons were consumed in Canada and about 100,000 tons were exported, mainly to the U.S.A. There are no known imports of ammonium phosphate for fertilizer use. Total sales in 1964 probably had a value of about \$35 million.

In Canada, the principal uses of ammonium phosphates are for direct application to the soil as a fertilizer and as an ingredient in the manufacture of mixed fertilizers. Relative to these uses, others are of very minor importance. The fertilizer grade is known to have some application as a fire retardant for wood materials.

Canadian use for direct application as a fertilizer is growing very rapidly. In the 1958-59 crop year, sales for this purpose were reported to be 100,000 tons; in 1963-64, five years later, such sales amounted to 306,000 tons, more than three times as much. Sales of ammonium phosphate are mainly in provinces west of Ontario, partly because of the high cost of overland transportation from Alberta and British Columbia plants, and partly because somewhat different fertilizer formulations are used in Central and Eastern Canada.

It should be noted that the following table excludes the ammonium phosphate which is used in the manufacture of ammonium nitrate phosphate, a mixture of ammonium phosphate (11-48-0) and ammonium nitrate. It is estimated that the ammonium nitrate phosphate applied directly to the soil in 1962, 1963 and 1964 contained about 6,000, 10,000 and 17,000 tons, respectively, of ammonium phosphate. Ammonium nitrate phosphate is used, almost exclusively, in the Prairie Provinces and British Columbia.

Sales of Ammonium Phosphate for Direct Application
and for the Manufacture of Mixed Fertilizers, 1957-64

	<u>For Direct Application</u> ^(a)			<u>Manufacture</u>	<u>Total</u>
	<u>East</u>	<u>West</u>	<u>Canada</u>	<u>of Fertilizer</u>	
			-	tons -	
1957	1,407	65,521	66,928	6,586	73,514
1958	3,595	74,056	77,651	11,562	89,213
1959	3,155	96,874	100,029	9,776	109,805
1960	6,078	112,311	118,389	10,466	128,855
1961	4,459	137,508	141,967	10,547	152,514
1962	5,500	169,712	175,212	10,505	185,717
1963	8,272	224,547	232,819	..	..
1964	12,828	292,734	305,562	..	..

(a) Crop years ended June 30

Source: D.B.S., The Fertilizer Trade, Cat. No. 46-207; Manufacturers of Mixed Fertilizers, Cat. No. 46-220

As indicated earlier, the monobasic (11-48-0) and dibasic (18-46-0) forms of ammonium phosphate may be varied in a fertilizer to yield different ratios of nitrogen to phosphoric acid. However, in Canada, the monobasic form accounts for about two-thirds of the total applied directly to the soil and a mixture, designated as 16-20-0, accounts for most of the remainder used for this purpose. The available information also indicates that it is the monobasic form which is used mainly in the manufacture of mixed fertilizers and that it is this form that is used in the production of ammonium nitrate phosphate.

Canadian export statistics do not show ammonium phosphate separately. However, the U.S.A. is the principal foreign market for the Canadian product and U.S. statistics show imports of the product from Canada. In 1964, the U.S.A. imported from Canada 96,000 tons, valued at \$5.8 million. Some ammonium phosphate is exported to countries other than the U.S.A. For example, Cominco reported exports of 25,000 tons in 1960 to countries other than the U.S.A. In recent years Canadian exports have fluctuated widely but generally have been less than in the late 1950's. In 1959 exports to the U.S.A. reached a peak of 215,000 tons, declined to about 108,000 tons in 1961, increased to 156,000 tons in 1962 but, as noted above, were lower again in 1964. A spokesman for Cominco attributed the decline largely to the increased demand in Canada. The very substantial additions to Canadian productive capacity in the past two years may result in increased exports. Ammonium phosphate is imported into the U.S.A. free of duty.

Relative to the commercial importance of the fertilizer grades the Canadian market for the single chemical is negligible. Imports of monobasic ammonium phosphate were reported separately until 1960; their value increased from \$5,000 in 1958 to \$37,000 in 1960, the latest year for which data are available. Ammonium phosphate dibasic is known to be used by the textile industry in dyeing processes, water treatment and as an ingredient of flame-proofing components. The product is not made in Canada and the available data indicate annual imports varying between about \$20,000 and \$40,000 in the years 1957 to 1960. No data are available after 1960.

Exports of Ammonium Phosphate, for Fertilizer, to the U.S.A.,
1957-64

	'000 tons	\$U.S. '000	\$U.S. per ton
1957	169	11,480	68.02
1958	159	10,207	64.39
1959	215	13,589	63.23
1960	118	7,321	62.19
1961	108	7,075	65.35
1962	156	9,274	59.36
1963	125	7,153	57.10
1964	96	5,812	60.45

Source: U.S. Imports of Merchandise for Consumption, Publication No. FT-110, s.c. 8509000 and s.c. 8530000

Tariff Considerations

Ammonium phosphate may be entered under tariff item 218, "acid phosphate, not medicinal" at rates of Free, B.P. and 25 p.c., M.F.N. However, because the overwhelming use of ammonium phosphate is as a fertilizer or in the manufacture of fertilizers, most imports would be entered under item 663, Free, B.P. and 5 p.c., M.F.N., as a manufactured or compounded fertilizer, or under item 663b, free of duty under all Tariffs, when for use in the manufacture of fertilizers. The single chemicals would not normally be used for fertilizer and therefore would be entered under item 218. As noted above, imports have not been large.

In the Brussels Nomenclature, ammonium phosphate which contains six milligrammes or more of arsenic per kilogramme is classified with fertilizers under B.T.N. heading 31.05; if it contains less arsenic than six milligrammes per kilogramme, it is classified under heading 28.40 with the other phosphates. A spokesman for Cominco informed the Board that a typical analysis of his company's product gave an arsenic content of 80 parts per million, or .008 per cent. The six milligramme specification of the B.T.N. is equivalent to an arsenic content of .0006 per cent. This spokesman also stated that to his knowledge 80 parts per million would not be considered a high arsenic content, suggesting that the ammonium phosphates of fertilizer grade which are sold in North America would be classified under heading 31.05.

At the public hearing, in February, 1961, Consolidated Mining and Smelting Company of Canada Limited proposed that ammonium phosphates be entered free of duty under the B.P. and M.F.N. Tariffs.⁽¹⁾ Although the company's interest would be mainly in the fertilizers of heading 31.05, the spokesman did not qualify his proposal to apply only to these.

Electric Reduction Company of Canada Limited (Erco) proposed rates of Free, B.P. and 15 p.c., M.F.N. for both the monobasic and dibasic forms, until they were made in Canada. The company proposed

⁽¹⁾ Transcript, Vol. 28, p. 4153

that rates of 15 p.c., B.P. and 20 p.c., M.F.N., should apply when the products are made in Canada.⁽¹⁾ The company's interest was in the single chemicals of heading 28.40.

The Primary Textiles Institute urged that ammonium phosphate dibasic, the single chemical of heading 28.40, be free of duty under both the B.P. and M.F.N. Tariffs, until it is made in Canada. The Institute supported rates of 15 p.c., B.P. and 20 p.c., M.F.N., when the product is made in Canada.⁽²⁾

The Canadian Pulp and Paper Association listed the dibasic and monobasic ammonium phosphates as materials used by its members and urged that there be no increase in the rates of duty for chemicals used in the production of pulp and paper.⁽³⁾

The Canadian Federation of Agriculture listed ammonium phosphate and diammonium phosphate (ammonium phosphate dibasic) as materials used for fertilizers and urged continuation of the rates under tariff items 663 and 663b.⁽⁴⁾

Thus, the only proposal before the Board related specifically to ammonium phosphate of heading 31.05 (fertilizers) was for free entry under both the B.P. and M.F.N. Tariffs. If ammonium phosphate of this purity were imported, it would be entered mainly under tariff item 663 (for direct use as a fertilizer) at rates of Free, B.P. and 5 p.c., M.F.N., or under item 663b (for the manufacture of fertilizers) free of duty under all Tariffs.

For the ammonium phosphate of heading 28.40, the single chemical of relatively high purity, two proposals were placed before the Board. The Primary Textiles Institute urged free entry under the B.P. and M.F.N. Tariffs, while Erco proposed rates of Free, B.P. and 15 p.c., M.F.N. The proposal by Cominco would have the effect of providing free entry for this product.

Cominco, the largest producer of the fertilizer grades, urged free entry for the fertilizer grades on the grounds that any increase in tariffs for these grades might result in retaliation on the part of other countries. The company spokesman pointed out that the high costs of overland transportation to Canadian markets east of Manitoba forced Western Canadian producers to seek outlets for their products in export markets, particularly in the U.S.A. He said that tariffs had not been a factor in the establishment of the Canadian industry and that the Canadian products were competitive in foreign markets because of such factors as cheap sulphuric acid.

Erco appeared before the Board as a potential producer of the single chemical of heading 28.40. The company spokesman appeared to assume that Canadian producers could never hope to compete successfully in the Canadian market without tariff protection. Basing his stand on

(1) Transcript, Vol. 28, p. 4059

(2) Same, Vol. 28, p. 4160-1

(3) Same, Vol. 85, p. 13006

(4) Same, Vol. 83, p. 12813

this assumption, he argued that even when they are not produced in Canada, chemicals should be dutiable, although at lower rates than when they were made in Canada. He said that in this way the resentment of consumers would be less when a product was ruled to be made in Canada and its price was increased because of the higher rate at which it would then become dutiable. As indicated earlier, Erco proposed rates of Free, B.P. and 15 p.c., M.F.N., while the single ammonium phosphates were not made in Canada, and rates of 15 p.c., B.P. and 20 p.c., M.F.N., when they were ruled to be made in Canada.

The Primary Textiles Institute opposed this stand on the grounds that a duty on a product which was not produced in Canada would confer no benefits on any Canadian manufacturer but would contribute to higher costs of production for manufacturers who used that product. The spokesman for the Institute pointed out that many years might pass before the Canadian market was sufficiently large to support Canadian production of some chemicals and that in this period users would be subjected to higher costs because of a tariff, if the viewpoint of Erco were accepted.

The Primary Textiles Institute supported rates of 15 p.c., B.P. and 20 p.c., M.F.N., for ammonium phosphate dibasic when it was ruled to be made in Canada. However, the Institute urged free entry under both the B.P. and M.F.N. Tariffs, until that time. The spokesman for the Institute did not indicate why rates of 15 p.c., B.P. and 20 p.c., M.F.N., would be appropriate when the product was made in Canada.

AMMONIUM NITRATE PHOSPHATE

Ammonium nitrate phosphate is a mixture of ammonium nitrate and ammonium phosphate. The proportions of the two chemicals in the mixture are varied to yield different combinations of contained nitrogen and phosphoric acid in the finished product. The three mixtures which are known to be produced in Canada are designated as "23-23-0", "24-20-0" and "27-14-0". The first figure indicates the percentage of nitrogen, the second figure the percentage of phosphorus in terms of phosphoric acid and the third figure the percentage of potassium in terms of potassium oxide. Ammonium phosphate monobasic, the fertilizer grade of which is used in the mixture, would be designated as "11-48-0"; ammonium nitrate contains about 33.5 per cent of nitrogen, in the fertilizer grade.

The grades of ammonium nitrate phosphate mentioned above and the approximate combinations of ammonium phosphate and ammonium nitrate which are used in their manufacture are shown below.

<u>Grade of Ammonium Nitrate Phosphate</u>	<u>Ammonium Phosphate</u> Approx. % in mixture	<u>Ammonium Nitrate</u>
23 - 23 - 0	50	50
24 - 20 - 0	40	60
27 - 14 - 0	30	70

The only known use of ammonium nitrate phosphate, in Canada, is for direct application to the soil as a fertilizer. The material has been listed separately in the statistics only since the crop year of 1961-62. In that 12 month period, 18,255 tons were used in Canada. In the following crop year the consumption increased to 30,896 tons and in 1963-64 it was 50,511 tons. The material is used almost entirely in the Prairie Provinces and British Columbia. It is known that a substantial part of the Canadian production is exported, but there are no published data on exports.

Tariff Considerations

Ammonium nitrate phosphate could be entered under tariff item 663 at rates of Free, B.P. and 5 p.c., M.F.N., if imported for direct application to the soil, and free of duty under item 663b if entered for use in the manufacture of fertilizers. If imported for use in other applications the material would probably be classified under tariff item 220a(i) at rates of 15 p.c., B.P. and 20 p.c., M.F.N.; no such applications are known.

In the Brussels Tariff Nomenclature, a mixture of ammonium phosphate and ammonium nitrate would be classified under heading 31.05 as a "composite and complex" fertilizer.

The Canadian Federation of Agriculture listed "ammonium phosphate nitrate" as a fertilizer in which it was interested. Presumably the description of the material is a variant of the term, ammonium nitrate phosphate. The representations of the Federation were general in nature and are dealt with in a preceding section of the report relating to fertilizers in general.

There were no other representations made to the Board relating specifically to ammonium nitrate phosphate. Some of the general representations noted earlier would apply to the material discussed here.

MIXED FERTILIZERS

Introduction

The Brussels Tariff Nomenclature provides for mixed fertilizers, mainly in heading 31.05. However, mixtures consisting of nitrogenous products mixed together or mixed with inorganic non-fertilizing substances, are classified under heading 31.02; phosphatic materials mixed together are under heading 31.03; and potassic materials mixed together are under heading 31.04. In general, heading 31.05 applies to mixtures of products which are classified under two or more headings, for example, nitrogenous with phosphatic or potassic materials mixed together.

The Explanatory Notes to the Brussels Nomenclature indicate clearly the nature of the mixtures which are classified under each of the headings 31.01 to 31.04 inclusive. However, although the notes are specific with respect to the goods which are classified in headings 31.01, 31.02, 31.03 and 31.04, those which relate to the mixtures of

heading 31.05 indicate a very broad coverage and make provision for any fertilizer mixture which is not already covered by one of the other headings of Chapter 31.

It should be noted that the mixtures that are classified in heading 31.05 may be of products which, taken alone, are not classified in headings 31.02 to 31.04. It should also be noted that separate chemically defined compounds, for example, potassium nitrate or potassium phosphate, are excluded from heading 31.05 even though they could be used as fertilizers.

The materials that are sold in Canada as "mixed fertilizers" contain at least two of the three principal fertilizing ingredients (nitrogen, phosphorous and potassium) and usually contain all three of them. All such mixed fertilizers would be under heading 31.05 in the B.T.N. They are produced and sold by the mixed fertilizer industry, together with a variety of other fertilizer products, some of which would also be classified in heading 31.05.

The mixed fertilizer industry is discussed in some detail in a preceding part of the report dealing with fertilizers in general; the discussion which follows is partly in the nature of a summary of some of this material.

The Industry

In 1962, the mixed fertilizer industry included 45 plants operated by 26 companies. The production of fertilizers was the principal activity of most of the companies and most of the individual plants would normally be used only for the manufacture of fertilizers. In 1962 the 45 plants shipped 826,000 tons of mixed fertilizers, valued at \$46.4 million.

More than one-half of the plants, 27 out of the 45, were located in Ontario and only one plant was in the Prairie Provinces, at Winnipeg. There were seven plants in the Atlantic Provinces, six in Quebec and four in British Columbia. Sixty per cent of the value of shipments was by Ontario plants, 23 per cent by Quebec plants and 15 per cent was by plants in the Atlantic Provinces. Of the remaining two per cent, most was by the four plants in British Columbia. From the foregoing, it is apparent that most of the production and sales of mixed fertilizers are east of Manitoba; the Prairies and British Columbia are of minor importance as markets for mixtures.

In contrast to single fertilizer compounds, which are usually quite highly concentrated, mixed fertilizers generally contain fairly large amounts of non-fertilizing matter. For example, in the crop year 1963-64 six mixed fertilizer formulations out of more than 100 that were sold accounted for more than 50 per cent of the total volume of sales. The most concentrated of the six was that designated as 4-24-20 which would contain four per cent of nitrogen, the equivalent of 24 per cent of phosphoric acid and the equivalent of 20 per cent of potassium oxide. In comparison, ammonia contains about 84 per cent of nitrogen, triple superphosphate, 46 per cent of phosphoric acid and the agricultural grade of potassium chloride at least 60 per cent of potassium oxide. Because of the relatively low concentration of fertilizer

elements in mixtures, it is the general practice to locate mixed fertilizer plants near the market which they are intended to serve and to bring in the more highly concentrated materials which are used in their manufacture. Thus, mixed fertilizer plants mainly serve regional or even local markets. The foreign trade in mixed fertilizers is also relatively limited in scope because of the relatively high cost of transportation.

The principal materials purchased by the mixed fertilizer industry are superphosphate, potassium chloride, phosphate rock, sulphuric acid and nitrogen solutions. In addition to those purchased, the industry also uses large quantities of captively-produced materials such as ammonia and urea as well as captively-produced sulphuric acid and superphosphates.

Selected Materials Used in the Manufacture of Mixed Fertilizers,
1961 and 1962

	1961		1962	
	'000 tons	\$'000	'000 tons	\$'000
Superphosphates	428	12,281	440	13,026
Potassium chloride	155	5,982	170	6,850
Phosphate rock	239	3,518	340	5,237
Sulphuric acid	127	2,629	237	3,614
Nitrogen solutions	51	3,344	58	3,576
Ammonium sulphate	39	1,475	39	1,407
Potassium sulphate	23	1,196	22	1,178
Other materials	..	5,718	..	4,820
Total	..	36,143	-	39,708

Source: D.B.S., Manufacturers of Mixed Fertilizers, Cat. No. 46-220

The Market

The Canadian market for mixed fertilizers is growing rapidly. In the crop year 1960-61, less than 800,000 tons were sold in Canada; in 1963-64, sales in Canada were almost 850,000 tons. Sales in Canada in 1963-64 are estimated to have had a value of approximately \$50 million including imports valued at about \$0.5 million. In addition Canada exported 87,000 tons of prepared fertilizer mixtures in 1963-64, valued at \$5.8 million. Thus Canadian manufacturers currently appear to have a total market for more than 900,000 tons of mixed fertilizers annually, valued at more than \$55 million.

The following table shows shipments of mixed fertilizers by Canadian manufacturers. It is important to note that some of the plants whose sales are included in this tabulation are classified in other industries, by the D.B.S. In 1962 plants classified in other industries sold mixed fertilizers valued at \$3.7 million.

Shipments of Mixed Fertilizers of Own Manufacture
Selected Years, 1953-62

	'000 tons	\$'000	\$ per ton
1953	695	32,751	47.12
1955	686	33,112	48.27
1957	723	37,026	51.21
1959	757	41,498	54.82
1960	791	42,739	54.03
1961	871	49,344	56.65
1962	887	50,117	56.50

Source: D.B.S., Manufacturers of Mixed Fertilizers, Cat. No. 46-220

As already indicated, foreign trade is a relatively small part of the commercial trade in mixed fertilizers. In recent years imports have been between \$500,000 and \$750,000 annually. Exports are very much larger than imports and have been from about \$2.8 million to \$3.5 million annually. In 1964 exports rose sharply to \$9.4 million as the result of large exports to Cuba. Ordinarily, almost all Canadian foreign trade in mixed fertilizers is with the U.S.A.

Exports and Imports of Mixed Fertilizers
1959-64

	<u>Exports</u>	<u>Imports</u>	<u>Net Export</u>
	- thousand dollars -		<u>Balance</u>
1959	2,205	750	1,455
1960	3,412	471	2,941
1961	3,352	823	2,529
1962	3,511	558	2,953
1963	2,752	537	2,215
1964	9,380	720	8,660

Source: D.B.S., Trade of Canada, Exports, s.c. 41689 and Trade of Canada, Imports, s.c. 8166

Tariff Considerations

The fertilizers which have been discussed in the foregoing would be entered under tariff item 663 as manufactured or compounded fertilizers, with rates of Free, B.P. and 5 p.c., M.F.N. They could also be entered under item 663b, free of duty under all Tariffs, if imported for use in the manufacture of fertilizers, but it is unlikely that they would be imported except for application to the soil.

Under the B.T.N. they would be classified as composite and complex fertilizers, under heading 31.05.

Several proposals were made to the Board regarding mixed fertilizers; these were by the Industry Committee, the Canadian Fertilizer Association, the Canadian Federation of Agriculture, the National Farmers Union and others. These proposals also were related to other fertilizers and fertilizer materials and involved general questions of classification and rates. Because of their general nature they are discussed in a preceding part of the report which deals with fertilizers in general.

OTHER FERTILIZERS OF B.T.N. HEADING 31.05

The preceding parts of this discussion of the products of heading 31.05 have dealt firstly, with individual products (ammonium phosphates, ammonium nitrate phosphate) and secondly, with mixed fertilizers. In addition to these, heading 31.05 includes certain products for which there are no available statistics. The Explanatory Notes to the Brussels Nomenclature describes these materials in the following terms:

- "1. Natural animal or vegetable fertilisers chemically treated, for example ... animal or vegetable materials converted into fertilisers by the action of chemicals ...
2. Compost ... treated with lime, calcium cyanamide, etc.
3. Certain industrial wastes such as wool scouring residues, etc.
4. Mixtures of fertilising substances (i.e., those containing nitrogen, phosphorus or potassium) with non-fertilising substances, e.g., sulphur ...
5. Natural potassic sodium nitrate fertiliser, a natural mixture of sodium nitrate and potassium nitrate.

"The heading also covers the goods of this Chapter if put up in tablets, lozenges or similar prepared forms or in packings of a gross weight not exceeding ten kilogrammes."(1)

All of these could be entered under tariff item 663, Free, B.P. and 5 p.c., M.F.N., if they were imported for direct application to the soil; they are unlikely to be imported for any other purpose.

No representations were made to the Board related specifically to particular goods which would be included in the above. The general proposals which would apply to them are discussed in the part of the report dealing with fertilizers in general.

(1) Explanatory Notes to the Brussels Nomenclature 1955, p. 308-9

APPENDIX IStatistical TablesImports

<u>Table</u>	<u>Page</u>
1 Tankage	111
2 Ammonia, nitrate of	112
3 Ammonium sulphate	113
4 Nitrate of soda or cubic nitre	115
5 Nitrogen solution	116
6 Nitrogen fertilizer, n.o.p.	117
7 Triple superphosphate	118
8 Superphosphate, n.o.p.	119
9 Phosphate fertilizer, n.o.p.	120
10 Basic slag	121
11 Phosphate rock	122
12 Potash, muriate of	123
13 Potash, sulphate of	125
14 Sulphate of potash magnesia and potash fertilizer, n.o.p.	126
15 Potash fertilizer, n.o.p.	127
16 Fertilizer, mixed	128
17 Fertilizer materials, n.o.p.	129
18 Fertilizers and fertilizer materials, n.e.s.	130
19 Diatomaceous earth, or infusorial earth (Kiesselguhr), ground or unground	131
20 Fertilizer making and mixing machinery, equipment and parts	132
21 Articles, not mentioned elsewhere, which enter into the cost of the manufacture of fertilizers	133

Exports

<u>Table</u>	<u>Page</u>
1 Fish offal and refuse	134
2 Whale meal and whale guano	134
3 Ammonium sulphate	135
4 Nitrogen-phosphate fertilizers	135
5 Nitrogen fertilizer, n.o.p.	136
6 Chemical fertilizers, mixed	136
7 Phosphate (fertilizer)	137
8 Fertilizer, mixed	137
9 Fertilizers, except animal, n.o.p.	137
10 Fertilizer materials, n.o.p.	138
11 Ammonium nitrate	138
12 Animal manures, n.e.s.	138

Imports: Tankage, s.c. 2343(a)

Tariff Items Various

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	ton	\$	Value \$/ton	Value \$	Collected \$	p.c. of Dutiable Value
<u>1. Total</u>						
1953	2,231	73,949	33.15	-	-	-
1954	2,254	62,169	27.58	36,237	1,812	5.0
1955	2,839	61,478	21.65	31,042	1,552	5.0
1956	2,309	71,297	30.88	30,524	2,300	7.5
1957	4,544	180,258	39.67	147,663	25,982	17.6
1958	4,960	141,377	28.50	59,897	6,555	10.9
1959	5,821	200,226	34.40	104,871	15,610	14.9
1960	4,965	169,728	34.18	106,379	19,124	18.0
1961	4,643	196,405	42.30	116,669	21,455	18.4
1962	3,298	110,349	33.46	51,483	8,205	15.9
1963	4,637	204,885	44.18	123,824	22,992	18.6
1964	3,072	278,416	90.63	214,327	40,873	19.1
1965	1,110	121,859	109.78	..	..	..
<u>2. United States</u>						
1953	2,147	61,701	28.74	-	-	-
1954	2,183	57,654	26.41	36,237	1,812	5.0
1955	2,795	57,589	20.60	31,042	1,552	5.0
1956	2,270	63,455	27.95	30,524	2,300	7.5
1957	4,522	176,927	39.13	147,663	25,982	17.6
1958	4,912	134,451	27.37	59,897	6,555	10.9
1959	5,782	193,319	33.43	104,871	15,610	14.9
1960	4,942	166,575	33.71	106,379	19,124	18.0
1961	4,615	192,151	41.64	116,669	21,455	18.4
1962	3,291	109,218	33.19	51,483	8,205	15.9
1963	4,618	201,010	43.53	123,824	22,992	18.6
1964	2,853	247,555	86.77	189,196	35,848	18.9
1965	1,107	118,826	107.34	..	..	..

(a) Beginning in 1964 included in s.c. 209-73, "Primary Tankage" which includes former s.c. 2051 and 2343

Imports: Ammonia, nitrate of, s.c. 8261^(a)

Tariff Items 208i and 208j

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	ton	\$	\$/ton	\$	\$	
	(000)			(000)		
	<u>1. Total</u>					
1953	805	79	98.25	68	11,952	17.4
1954	859	86	100.14	80	14,257	17.7
1955	830	95	113.89	95	16,425	17.4
1956	695	94	134.97	94	14,773	15.8
1957	104	16	150.41	15	3,147	20.4
1958	29	6	208.00	6	1,492	25.0
1959	26	4	159.42	4	1,011	25.0
1960	30	5	165.70	5	1,211	25.0
1961	648	40	62.37	31	6,288	20.4
1962	75	5	68.08	4	952	25.0
1963	50	3	68.14	3	689	20.2

<u>2. United States</u>						
1953	700	69	98.50	69	11,952	17.4
1954	805	80	98.78	80	14,018	17.6
1955	830	95	113.89	95	16,425	17.4
1956	695	94	134.97	94	14,773	15.8
1957	103	15	150.09	15	3,147	20.4
1958	29	6	205.72	6	1,492	25.0
1959	25	4	161.76	4	1,011	25.0
1960	30	5	161.20	5	1,211	25.0
1961	647	40	62.31	31	6,288	20.4
1962	75	5	68.08	4	952	25.0
1963	50	3	68.14	3	689	20.2

^(a) Beginning in 1964, included in s.c. 416-99

Imports: Ammonium sulphate, s.c. 8151 (a)

Tariff Item 208

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u>
	<u>ton</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	<u>p.c. of</u>
		(000)	\$/ton	\$	\$	Dutiable
				(000)		Value

1. Total

1953	21,254	926	43.55	-	-	-
1954	14,101	602	42.67	-	-	-
1955	7,029	311	44.28	-	-	-
1956	3,144	143	45.42	-	-	-
1957	3,288	130	39.49	-	-	-
1958	5,892	219	37.10	-	-	-
1959	5,941	208	35.04	-	-	-
1960	8,686	276	31.83	1	121	15.0
1961	9,940	306	30.79	6	440	7.2
1962	14,151	393	27.77	1	173	15.0
1963	14,259	488	34.19	-	-	-
1964	17,628	598	33.93	1	120	9.3

2. United Kingdom

1953	530	29	55.53	-	-	-
1954	427	23	52.98	-	-	-
1955	505	29	58.39	-	-	-
1956	406	26	64.81	-	-	-
1957	304	19	63.68	-	-	-
1958	398	25	63.38	-	-	-
1959	210	13	62.22	-	-	-
1960	238	14	58.23	-	-	-
1961	269	16	59.53	-	-	-
1962	272	16	59.45	-	-	-
1963	148	10	65.74	-	-	-
1964	134	9	66.02	-	-	-

Year	Total Imports		Unit Value \$/ton	Dutiable Value \$ (000)	Duty Collected \$	Duty as p.c. of Dutiable Value
	ton	\$ (000)				

3. United States

1953	4,607	223	48.41	-	-	-
1954	13,009	550	42.29	-	-	-
1955	6,316	271	42.87	-	-	-
1956	2,320	95	40.88	-	-	-
1957	2,770	101	36.29	-	-	-
1958	5,174	178	34.38	-	-	-
1959	5,373	178	33.05	-	-	-
1960	3,367	124	36.78	-	-	-
1961	2,923	112	38.38	5	292	5.7
1962	3,047	129	42.24	1	173	15.0
1963	3,583	153	42.65	-	-	-
1964	9,130	337	36.93	*	9	4.9

4. Germany, Fed. Rep. of

1953	6,441	303	46.99	-	-	-
1954	666	29	43.38	-	-	-
1955	209	11	52.56	-	-	-
1956	418	22	51.73	-	-	-
1957	215	10	46.30	-	-	-
1958	321	15	48.26	-	-	-
1959	358	17	48.87	-	-	-
1960	387	19	48.66	1	121	15.0
1961	445	24	53.40	1	148	15.0
1962	402	23	56.17	-	-	-
1963	9,528	299	31.36	-	-	-
1964	4,333	107	24.74	1	111	10.0

(a) Beginning in 1964 renumbered as s.c. 416-48

Imports: Nitrate of soda or cubic nitre, s.c. 8157^(a)

Tariff Items 210e and 663b

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	ton	\$ (000)	Value \$/ton	Value \$ (000)	Collected \$	p.c. of Dutiable Value
<u>1. Total</u>						
1953	20,052	1,043	52.02	-	-	-
1954	17,969	795	44.26	-	-	-
1955	21,426	928	43.31	-	-	-
1956	27,529	1,208	43.88	-	-	-
1957	25,598	1,085	42.40	-	-	-
1958	22,728	1,011	44.49	-	-	-
1959	21,684	880	40.60	2	235	12.5
1960	18,283	810	44.31	2	240	12.5
1961	16,356	826	50.48	*	27	12.6
1962	17,018	921	54.13	*	58	12.4
1963	16,749	893	53.32	2	235	12.5
1964	20,210	1,080	53.43	-	-	-
<u>2. United States</u>						
1953	19,568	1,015	51.89	-	-	-
1954	17,094	740	43.31	-	-	-
1955	21,038	906	43.05	-	-	-
1956	27,110	1,185	43.70	-	-	-
1957	25,136	1,059	42.14	-	-	-
1958	21,948	968	44.09	-	-	-
1959	20,223	817	40.39	2	235	12.5
1960	17,181	756	43.98	2	240	12.5
1961	10,632	544	51.15	-	-	-
1962	12,198	659	54.04	-	-	-
1963	9,512	503	52.86	-	-	-
1964	11,596	633	54.57	-	-	-
<u>3. Chile</u>						
1953	461	26	56.08	-	-	-
1954	853	53	62.56	-	-	-
1955	323	17	54.06	-	-	-
1956	380	20	53.05	-	-	-
1957	380	20	51.49	-	-	-
1958	746	40	54.09	-	-	-
1959	1,449	63	43.52	-	-	-
1960	1,100	54	49.35	-	-	-
1961	5,661	278	49.09	-	-	-
1962	3,914	207	53.00	-	-	-
1963	7,177	386	53.84	2	235	12.5
1964	8,581	444	51.75	-	-	-

(a) Beginning in 1964 renumbered as s.c. 416-33

Imports: Nitrogen solution, s.c. 8149^(a)

Tariff Items 663 and 663b

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	ton	\$	\$/ton	\$	\$	
		(000)		(000)		
<u>1. Total</u>						
1953	..	..	..	..	..	..
1954	37,401	2,276	60.84	-	-	-
1955	36,233	2,178	60.11	20	986	5.0
1956	33,222	1,971	59.33	27	1,366	5.0
1957	33,142	1,873	56.51	14	676	5.0
1958	25,846	1,429	55.31	107	5,371	5.0
1959	21,827	1,154	52.87	8	404	5.0
1960	20,509	1,171	57.09	5	550	11.8
1961	29,082	1,838	63.19	30	3,009	10.2
1962	7,010	481	68.63	1	152	12.3
1963	8,349	515	61.67	3	333	11.2
1964	17,900	1,058	59.11	90	6,063	6.7

2. United States

1953	..	..	..	..	..	..
1954	37,401	2,276	60.84	-	-	-
1955	36,178	2,173	60.05	20	986	5.0
1956	33,222	1,971	59.33	27	1,366	5.0
1957	33,142	1,873	56.51	14	676	5.0
1958	25,846	1,429	55.31	107	5,371	5.0
1959	21,827	1,154	52.87	8	404	5.0
1960	20,509	1,171	57.09	5	550	11.8
1961	29,082	1,838	63.19	30	3,009	10.2
1962	7,010	481	68.63	1	152	12.3
1963	8,349	515	61.67	3	333	11.2
1964	17,900	1,058	59.11	90	6,063	6.7

(a) Beginning in 1964 renumbered as s.c. 416-39 which also includes part of former s.c. 8264

Imports: Nitrogen fertilizer, n.o.p., s.c. 8150^(a)

Tariff Items 663 and 663a

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	Duty as p.c. of Dutiable Value
	<u>ton</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
		(000)	\$/ton	\$	\$	
<u>1. Total</u>						
1953	..	..	..	..	..	..
1954	1,066	60	56.25	1	69	5.0
1955	374	20	53.09	2	120	5.0
1956	228	13	55.53	3	131	5.0
1957	32	1	36.09	-	-	-
1958	40	3	81.75	*	14	5.1
1959	376	59	157.36	10	478	5.0
1960	601	144	240.30	32	1,621	5.0
1961	663	134	202.41	6	288	5.0
1962	995	193	193.75	30	1,514	5.0
1963	773	162	209.85	11	567	5.0

2. United States

1953	..	..	..	..	..	..
1954	982	56	57.44	1	69	5.0
1955	374	20	53.09	2	120	5.0
1956	178	10	57.08	*	6	5.0
1957	22	1	27.91	-	-	-
1958	20	2	104.75	-	-	-
1959	348	57	165.14	10	478	5.0
1960	601	144	240.30	32	1,621	5.0
1961	643	133	207.11	5	237	5.0
1962	950	190	199.98	28	1,374	5.0
1963	736	160	217.80	10	485	5.0

(a) Beginning in 1964 included in s.c. 416-31 and s.c. 416-99

Imports: Triple superphosphate, s.c. 8161^(a)

Tariff Items 663 and 663b

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u>
	<u>ton</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	<u>p.c. of</u>
		(000)	\$/ton	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	..	..	..	..	..	..
1954	19,901	903	45.39	*	4	5.3
1955	35,324	1,607	45.49	3	173	5.0
1956	38,487	1,741	45.24	9	433	5.0
1957	45,380	2,004	44.16	17	871	5.0
1958	44,248	2,020	45.65	31	1,537	5.0
1959	64,328	2,885	44.85	5	268	5.0
1960	83,142	3,926	47.22	32	1,589	5.0
1961	67,435	3,392	50.30	49	2,435	5.0
1962	55,494	2,769	49.89	43	2,143	5.0
1963	41,946	2,068	49.31	42	2,107	5.0
1964	63,258	3,685	58.26	38	1,884	5.0

2. United States

1953	..	..	..	..	..	..
1954	19,901	903	45.39	*	4	5.3
1955	35,324	1,607	45.49	3	173	5.0
1956	38,487	1,741	45.24	9	433	5.0
1957	45,380	2,004	44.16	17	871	5.0
1958	44,248	2,020	45.65	31	1,537	5.0
1959	63,828	2,862	44.83	5	268	5.0
1960	83,142	3,926	47.22	32	1,589	5.0
1961	67,435	3,392	50.30	49	2,435	5.0
1962	55,494	2,769	49.89	43	2,143	5.0
1963	41,946	2,068	49.31	42	2,107	5.0
1964	63,258	3,685	58.26	38	1,884	5.0

(a) Beginning in 1964 renumbered as s.c. 416-26, which also includes part of former s.c. 8163

Imports: Superphosphate, n.o.p., s.c. 8162^(a)

Tariff Items 663 and 663b

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u>
	<u>ton</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	<u>p.c. of</u>
		(000)	\$/ton	\$(000)	\$	Dutiable Value
<u>1. Total</u>						
1953	..	..	..	..	..	..
1954	180,255	3,432	19.04	3	165	5.0
1955	175,944	3,263	18.55	*	8	5.3
1956	183,991	3,421	18.59	*	13	4.9
1957	163,746	3,131	19.12	31	1,558	5.0
1958	173,457	3,292	18.98	12	613	5.0
1959	142,143	2,606	18.33	*	24	5.1
1960	119,689	2,178	18.20	5	270	5.0
1961	124,564	2,232	17.92	20	995	5.0
1962	109,808	2,026	18.45	37	1,853	5.0
1963	83,938	1,597	19.02	38	1,917	5.0
1964	112,590	2,142	19.02	29	1,445	4.9

2. United States

1953	..	..	..	..	..	..
1954	177,741	3,293	18.53	3	165	5.0
1955	175,944	3,263	18.55	*	8	5.3
1956	183,991	3,421	18.59	*	13	4.9
1957	163,746	3,131	19.12	31	1,558	5.0
1958	168,459	3,211	19.06	12	613	5.0
1959	142,143	2,606	18.33	*	24	5.1
1960	117,382	2,145	18.28	5	270	5.0
1961	119,748	2,172	18.14	20	995	5.0
1962	104,084	1,955	18.78	37	1,853	5.0
1963	83,938	1,597	19.02	38	1,917	5.0
1964	112,590	2,142	19.02	29	1,445	4.9

(a) Beginning in 1964 renumbered as s.c. 416-23 "Superphosphate, 22 per cent or less phosphoric acid (P₂O₅)"

Imports: Phosphate fertilizer, n.o.p., s.c. 8163^(a)

Tariff Item 663b

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	ton	\$	\$/ton	\$	\$	
		(000)		(000)		
<u>1. Total</u>						
1953	..	..	..	..	..	..
1954	5,227	103	19.79	-	-	-
1955	2,654	160	60.14	-	-	-
1956	1,764	139	78.62	-	-	-
1957	2,830	205	72.60	-	-	-
1958	3,325	235	70.74	-	-	-
1959	3,985	273	68.60	5	257	5.0
1960	6,243	236	37.78	6	299	5.4
1961	6,729	569	84.61	5	263	5.0
1962	21,540	1,844	85.60	6	1,087	18.9
1963	37,017	3,289	88.84	2	106	5.0

2. United States

1953	..	..	..	..	..	..
1954	1,211	53	43.64	-	-	-
1955	1,830	90	49.30	-	-	-
1956	1,663	133	80.22	-	-	-
1957	2,574	191	74.08	-	-	-
1958	3,325	235	70.74	-	-	-
1959	3,985	273	68.60	5	257	5.0
1960	1,869	204	108.90	6	299	5.4
1961	6,679	567	84.92	5	263	5.0
1962	21,540	1,844	85.60	6	1,087	18.9
1963	37,017	3,289	88.84	2	106	5.0

(a) Beginning in 1964 included in s.c. 416-26

Imports: Basic slag (included item 7280 prior to 1954) s.c. 8152^(a)

Tariff Item 663

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	ton	\$	Value
		(000)	\$/ton

1. Total

1953
1954	1,579	21	13.09
1955	-	-	-
1956	1,120	29	26.25
1957	560	14	25.85
1958	840	22	26.25
1959	392	10	25.45
1960	560	15	26.25
1961	550	9	16.63
1962	300	5	17.37
1963	-	-	-

2. Belgium and Luxembourg

1953	..	..	..
1954	1,250	20	16.07
1955	-	-	-
1956	1,120	29	26.25
1957	560	14	25.85
1958	840	22	26.25
1959	392	10	25.45
1960	560	15	26.25
1961	550	9	16.63
1962	300	5	17.37
1963	-	-	-

(a) Beginning in 1964 included in s.c. 416-99

Imports: Phosphate, Rock, s.c. 7263^(a)

Tariff Items 662 and 663i

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	ton	\$ (000)	<u>Value</u> \$/ton
<u>1. Total</u>			
1953	576,500	3,951	6.85
1954	644,860	4,578	7.10
1955	588,209	4,513	7.67
1956	627,648	5,186	8.26
1957	723,220	5,898	8.15
1958	744,164	6,854	9.21
1959	797,063	7,468	9.37
1960	941,998	8,320	8.83
1961	1,056,885	9,679	9.16
1962	1,155,966	10,843	9.38
1963	1,297,427	12,204	9.41
1964	1,406,424	11,719	8.33
<u>2. United States</u>			
1953	565,300	3,660	6.47
1954	625,756	4,192	6.70
1955	577,026	4,233	7.34
1956	616,613	4,864	7.89
1957	722,215	5,840	8.09
1958	740,822	6,673	9.01
1959	790,853	7,126	9.01
1960	935,745	8,000	8.55
1961	1,039,910	9,044	8.70
1962	1,134,905	10,336	9.11
1963	1,266,043	11,432	9.03
1964	1,368,768	11,145	8.14

(a) Beginning in 1964 renumbered as s.c. 279-65; small quantity included in s.c. 404-06

Imports: Potash, muriate of, s.c. 8155 ^(a)

Tariff Item 209

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	ton	\$ (000)	\$/ton	\$ (000)	\$	
<u>1. Total</u>						
1953	120,773	2,914	24.13	-	-	-
1954	115,288	2,696	23.38	-	-	-
1955	138,492	3,231	23.33	-	-	-
1956	131,293	3,239	24.67	-	-	-
1957	136,646	3,406	24.93	-	-	-
1958	131,305	3,090	23.53	-	-	-
1959	95,299	2,282	23.95	1	174	11.9
1960	146,685	3,382	23.06	3	147	5.0
1961	169,777	4,402	25.93	12	1,462	11.9
1962	147,973	4,367	29.51	4	215	5.0
1963	74,073	2,096	28.30	2	84	5.0
1964	67,038	1,955	29.16	3	418	15.3
<u>2. United States</u>						
1953	66,053	1,574	23.83	-	-	-
1954	64,380	1,485	23.06	-	-	-
1955	69,887	1,619	23.16	-	-	-
1956	79,650	1,824	22.90	-	-	-
1957	76,250	1,685	22.10	-	-	-
1958	78,791	1,650	20.95	-	-	-
1959	54,790	1,289	23.53	1	174	11.9
1960	89,342	1,907	21.34	3	147	5.0
1961	107,267	2,540	23.68	12	1,462	11.9
1962	88,295	2,456	27.81	4	215	5.0
1963	37,572	1,002	26.68	2	84	5.0
1964	43,450	1,185	27.27	3	418	15.3

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u>
	<u>ton</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	<u>p.c. of</u>
		(000)	<u>\$/ton</u>	<u>\$</u>	<u>\$</u>	<u>Dutiable</u>
				(000)		<u>Value</u>

3. France

1953	28,566	681	23.82	-	-	-
1954	7,228	184	25.48	-	-	-
1955	29,668	683	23.02	-	-	-
1956	11,972	383	31.95	-	-	-
1957	24,236	747	30.83	-	-	-
1958	24,934	676	27.11	-	-	-
1959	16,269	383	23.51	-	-	-
1960	17,150	432	25.16	-	-	-
1961	24,310	730	30.02	-	-	-
1962	22,080	710	32.14	-	-	-
1963	14,009	389	27.74	-	-	-
1964	9,126	284	31.16	-	-	-

4. Germany, Fed. Rep. of

1953	25,061	630	25.13	-	-	-
1954	34,600	818	23.63	-	-	-
1955	36,737	876	23.85	-	-	-
1956	34,161	862	25.23	-	-	-
1957	36,159	974	26.94	-	-	-
1958	21,465	597	27.83	-	-	-
1959	18,753	483	25.75	-	-	-
1960	28,660	732	25.55	-	-	-
1961	32,751	944	28.82	-	-	-
1962	25,009	776	31.01	-	-	-
1963	9,593	301	31.33	-	-	-
1964	7,850	246	31.31	-	-	-

(a) Beginning in 1964 renumbered as s.c. 416-52; "Potassium chloride"

Imports: Potash, sulphate of, s.c. 8156^(a)

Tariff Item 209

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	ton	\$ (000)	\$/ton	\$ (000)	\$	
<u>1. Total</u>						
1953	12,798	458	35.78	-	-	-
1954	12,785	452	35.39	-	-	-
1955	13,957	459	32.86	-	-	-
1956	16,152	584	36.16	-	-	-
1957	17,722	610	34.44	-	-	-
1958	15,539	556	35.80	-	-	-
1959	24,742	815	32.94	-	-	-
1960	23,944	826	34.49	1	65	5.0
1961	26,478	1,023	38.63	-	-	-
1962	23,981	957	39.91	3	129	5.0
1963	18,914	758	40.09	9	433	5.0
1964	19,558	825	42.17	4	303	8.2
<u>2. United States</u>						
1953	8,555	315	36.81	-	-	-
1954	8,747	310	35.43	-	-	-
1955	10,330	341	33.06	-	-	-
1956	10,581	351	33.13	-	-	-
1957	11,114	363	32.64	-	-	-
1958	9,033	319	35.34	-	-	-
1959	14,542	497	34.16	-	-	-
1960	12,924	445	34.43	1	65	5.0
1961	17,324	666	38.44	-	-	-
1962	15,131	623	41.19	3	129	5.0
1963	13,808	567	41.09	9	433	5.0
1964	12,050	485	40.28	4	303	8.2
<u>3. France</u>						
1953	3,042	101	33.21	-	-	-
1954	4,038	143	35.30	-	-	-
1955	2,042	65	31.78	-	-	-
1956	4,006	181	45.11	-	-	-
1957	6,433	242	37.69	-	-	-
1958	4,581	170	37.17	-	-	-
1959	6,105	181	29.58	-	-	-
1960	5,559	184	33.14	-	-	-
1961	9,054	353	38.98	-	-	-
1962	8,341	312	37.44	-	-	-
1963	5,106	191	37.39	-	-	-
1964	4,409	170	38.59	-	-	-

(a) Beginning in 1964 renumbered as s.c. 416-57

Imports: Sulphate of potash, magnesite and potash fertilizer,
n.o.p., s.c. 8164 (a)

Tariff Items 662 and 663b

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	ton	\$	\$/ton	\$	\$	
		(000)		(000)		
<u>1. Total</u>						
1953	..	..	..	..	..	..
1954	1,779	24	13.66	-	-	-
1955	1,986	28	14.23	-	-	-
1956	2,359	39	16.72	-	-	-
1957	3,456	67	19.39	-	-	-
1958	3,128	61	19.54	-	-	-
1959	4,451	72	16.23	*	12	4.8
1960	5,564	80	14.36	*	22	5.0
1961	5,180	84	16.22	1	69	5.0
1962	5,742	110	19.14	-	-	-
1963	4,748	83	17.55	-	-	-
1964	6,203	106	17.01	-	-	-
<u>2. United States</u>						
1953	..	..	..	..	..	..
1954	1,779	24	13.66	-	-	-
1955	1,986	28	14.23	-	-	-
1956	1,859	29	15.54	-	-	-
1957	2,156	29	13.32	-	-	-
1958	2,728	50	18.47	-	-	-
1959	4,451	72	16.23	*	12	4.8
1960	5,064	68	13.50	*	22	5.0
1961	4,880	76	15.60	1	69	5.0
1962	4,967	87	17.56	-	-	-
1963	4,748	83	17.55	-	-	-
1964	6,203	106	17.01	-	-	-

(a) Beginning in 1964 renumbered as s.c. 416-59

Imports: Potash fertilizer, n.o.p., s.c. 8165^(a)

Tariff Items 662 and 663b

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>
	ton	\$	\$/ton
		(000)	
	<u>1. Total</u>		
1953	-	-	-
1954	19	2	124.11
1955	-	-	-
1956	21	2	108.33
1957	-	-	-
	<u>United States</u>		
1953	-	-	-
1954	1	*	282.00
1955	-	-	-
1956	21	2	108.33
1957	-	-	-
	<u>Germany - Fed. Rep. of</u>		
1953	-	-	-
1954	18	2	115.33
1955	-	-	-
1956	-	-	-
1957	-	-	-

(a) Beginning in 1958 included in s.c. 8164

Imports: Fertilizer, mixed, s.c. 8166^(a)

Tariff Items 210g and 663

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	ton	\$ (000)	\$/ton	\$ (000)	\$	
<u>1. Total</u>						
1954	3,629	289	79.61	278	13,883	5.0
1955	1,541	311	201.61	291	14,545	5.0
1956	2,598	375	144.17	362	18,092	5.0
1957	9,366	755	80.66	712	35,624	5.0
1958	3,053	471	154.37	431	21,527	5.0
1959	8,094	750	92.63	684	34,398	5.0
1960	4,060	471	115.95	449	22,585	5.0
1961	7,561	823	108.84	752	37,625	5.0
1962	2,376	558	235.04	483	38,710	8.0
1963	3,268	537	164.40	387	21,584	5.6
1964	3,613	720	199.30	466	24,248	5.2
<u>2. United States</u>						
1954	2,215	244	110.12	239	11,970	5.0
1955	1,503	303	201.32	291	14,545	5.0
1956	2,581	362	140.36	354	17,714	5.0
1957	9,344	746	79.79	712	35,624	5.0
1958	3,039	464	152.75	431	21,527	5.0
1959	8,088	746	92.21	684	34,393	5.0
1960	4,030	459	113.77	448	22,510	5.0
1961	7,538	809	107.37	749	37,474	5.0
1962	2,344	542	231.42	481	38,608	8.0
1963	3,251	526	161.91	383	21,358	5.6
1964	3,605	714	198.03	464	24,149	5.2

(a) Beginning in 1964 renumbered as s.c. 416-89 "Prepared Fertilizer Mixtures"; s.c. 8166 began January 1st, 1954

Imports: Fertilizer materials, n.o.p., s.c. 8167^(a)

Tariff Items 663 and 663b

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>ton</u>	<u>\$</u>	<u>\$/ton</u>	<u>\$</u>	<u>\$</u>	
		(000)		(000)		
<u>1. Total</u>						
1953	..	..	..	..	..	..
1954	4,038	244	60.41	77	3,867	5.0
1955	5,868	201	34.17	119	5,969	5.0
1956	6,237	357	57.20	148	7,411	5.0
1957	6,509	344	52.80	175	8,731	5.0
1958	9,417	565	60.00	338	16,901	5.0
1959	10,307	805	78.10	411	20,921	5.1
1960	9,535	710	74.49	198	9,888	5.0
1961	8,706	576	66.16	237	11,853	5.0
1962	8,056	551	68.43	245	12,835	5.2
1963	7,322	622	84.97	227	11,364	5.0
<u>2. United States</u>						
1953	..	..	..	..	..	..
1954	3,907	218	55.80	77	3,867	5.0
1955	5,790	186	32.09	119	5,969	5.0
1956	6,202	339	54.62	148	7,411	5.0
1957	6,476	340	52.51	175	8,731	5.0
1958	9,341	556	59.56	332	16,621	5.0
1959	10,150	787	77.56	411	20,921	5.1
1960	7,704	487	63.22	183	9,128	5.0
1961	8,472	539	63.66	237	11,853	5.0
1962	7,705	523	67.93	237	12,162	5.1
1963	7,266	598	82.28	227	11,364	5.0

(a) Beginning in 1964 included in s.c. 416-31 and 416-99

Imports: Fertilizers and fertilizer materials n.e.s., s.c. 416-99^(a)

Tariff Items various

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>ton</u>	<u>\$</u>	<u>\$/ton</u>	<u>\$</u>	<u>\$</u>	
	(000)	(000)		(000)		
<u>1. Total</u>						
1964	46,233	3,382	73.14	690	65,041	9.4
<u>2. United Kingdom</u>						
1964	80	29	365.74	-	-	-
<u>3. United States</u>						
1964	45,722	3,339	73.02	685	64,349	9.4
<u>4. Belgium/Luxembourg</u>						
1964	362	7	19.26	-	-	-
<u>5. Netherlands</u>						
1964	*	3	*	3	575	20.0
<u>6. Norway</u>						
1964	70	4	51.49	2	117	4.9

^(a) Prior to 1964 included in various statistical classes

Imports: Diatomaceous earth, or infusorial earth (Kieselguhr),
ground or unground, s.c. 7193(a)

Tariff Item 297

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	ton	\$ (000)	<u>Value</u> \$/cwt.
<u>1. Total</u>			
1953	19,350	671	1.73
1954	19,373	664	1.71
1955	22,158	789	1.78
1956	21,078	888	2.11
1957	25,288	1,078	2.13
1958	27,258	1,184	2.17
1959	27,260	1,158	2.12
1960	28,990	1,246	2.15
1961	28,875	1,346	2.33
1962	26,098	1,381	2.65
1963	26,612	1,406	2.64
1964	25,089	1,349	2.69
<u>2. United States</u>			
1953	19,308	669	1.73
1954	19,373	664	1.71
1955	22,133	788	1.78
1956	21,047	887	2.11
1957	25,256	1,077	2.13
1958	27,225	1,184	2.17
1959	27,178	1,154	2.12
1960	28,990	1,246	2.15
1961	28,875	1,346	2.33
1962	26,063	1,379	2.65
1963	26,612	1,406	2.64
1964	25,089	1,349	2.69

(a) Beginning in 1964 renumbered s.c. 274-30, "Diatomaceous (Infusorial) earth, crude or ground"; also includes tariff item 663b

Imports: Fertilizer making and mixing machinery, equipment and parts,
s.c. 529-35(a)

Tariff Items 427a and 663b

	<u>1964</u>	<u>Value</u> \$
1. Total		7,637,991
2. United Kingdom		12,989
3. United States		7,514,868
4. Belgium and Luxembourg		862
5. Denmark		27,471
6. Germany, Fed. Rep. of		81,300
7. Netherlands		501

(a) Prior to 1964 included in s.c. 5576

Imports: Articles, not mentioned elsewhere, which enter into the
cost of the manufacture of fertilizers, s.c. 9191^(a)

Tariff Item 663b

<u>Year</u>	<u>Total Imports</u> \$ (000)
-------------	-------------------------------------

1. Total

1953	87
1954	200
1955	546
1956	2,915
1957	1,033
1958	635
1959	272
1960	163
1961	79
1962	89
1963	22

2. United States

1953	83
1954	200
1955	515
1956	2,661
1957	1,026
1958	630
1959	271
1960	162
1961	78
1962	88
1963	21

(a) Beginning in 1964 included in s.c. 970-99

Exports: Fish offal and refuse, s.c. 2398^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1953	79,815	289,744	3.63
1954	110,614	414,967	3.75
1955	106,272	386,418	3.64
1956	87,142	299,604	3.44
1957	85,949	245,782	2.86
1958	84,105	247,659	2.94
1959	93,407	278,726	2.98
1960	102,694	324,635	3.16
1961 ^(b)	95,259	258,327	2.71
1962	109,172	289,636	2.65
1963	61,655	197,177	3.20
1964	112,776	279,313	2.48
1965 ^(c)	-	-	-

(a) Beginning in 1961 included in s.c. 416-03 and s.c. 398-59

(b) s.c. 416-03, "Fish offal and waste n.e.s."

(c) Class discontinued in 1965

Exports: Whale meal and whale guano, s.c. 2400^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1953	76,883	391,226	5.09
1954	31,275	165,896	5.30
1955	53,121	297,994	5.61
1956	34,409	216,112	6.28
1957	53,791	309,125	5.75
1958	106,272	629,319	5.92
1959	47,900	319,001	6.66
1960	20,236	128,241	6.34
1961 ^(b)	1,004	7,000	6.97
1962	14,192	95,554	6.73
1963	10,698	68,325	6.39
1964	52,956	350,724	6.62
1965	9,486	67,534	7.12

(a) Beginning in 1961 the meal portion is included in s.c. 416-06 and the remainder in s.c. 416-09

(b) s.c. 416-06, "Whale meal"

Exports: Ammonium sulphate, s.c. 8160^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	Unit <u>Value</u> \$/cwt.
1953	2,947,414	6,492,953	2.20
1954	3,095,199	6,964,552	2.25
1955	..	10,978,475	..
1956	..	12,072,905	..
1957	..	9,300,315	..
1958	..	8,223,655	..
1959	..	8,506,770	..
1960	..	8,572,429	..
1961	..	7,416,874	..
1962	..	7,103,219	..
1963	..	6,544,359	..
1964	..	6,057,433	..
1965	..	8,940,929	..

^(a) Beginning in 1961 renumbered as s.c. 416-48

Exports: Nitrogen-phosphate fertilizers, s.c. 8165^(a)

<u>Year</u>	<u>Value</u> \$
1959	22,894,111
1960	20,902,855
1961	19,685,356
1962	19,351,686
1963	13,074,910
1964	10,255,687
1965	19,457,046

^(a) Not available prior to 1959. Beginning in 1961 renumbered as s.c. 416-47 and the wording was changed to, "Ammoniated super-phosphate, ammonium phosphates, and nitrogen-phosphate fertilizers, n.e.s."

Exports: Nitrogen fertilizer, n.o.p., s.c. 8170^(a)

<u>Year</u>	<u>Value</u> \$
1953	21,787,314
1954	19,939,942
1955	25,354,694
1956	16,866,967
1957	18,114,493
1958	17,106,496
1959	14,420,401
1960	19,135,605
1961	22,373,081
1962	13,909,632
1963	15,828,121
1964	15,519,086
1965	14,896,349

(a) Beginning in 1961 renumbered as s.c. 416-45, "Urea sodium nitrate, calcium cyanamide, ammonium nitrate and nitrogen solutions": beginning in 1962 part of statistical class included in s.c. 416-44, "Ammonium nitrate"

Exports: Chemical fertilizers, mixed, s.c. 8175^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1959	795,834	2,204,978	2.77
1960	1,189,635	3,411,823	2.87
1961	1,152,368	3,352,052	2.91
1962	1,240,072	3,510,937	2.83
1963	805,652	2,752,444	3.42
1964	2,948,422	9,380,206	3.18
1965	973,585	3,785,138	3.89

(a) Not available prior to 1959. Beginning in 1961 renumbered as s.c. 416-89, "Prepared fertilizer mixtures"

Exports: Phosphate (fertilizer), s.c. 8180^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1953	3,538,886	11,921,565	3.37
1954	3,841,663	13,228,606	3.44
1955	..	17,408,564	..
1956	..	15,508,176	..
1957	..	12,994,804	..
1958	..	12,370,470	..

(a) Beginning in 1959 included in s.c. 8165 and 8190

Exports: Fertilizer, mixed (from Jan. 1, 1954), s.c. 8185^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1954	793,387	2,060,922	2.60
1955	871,871	2,408,222	2.76
1956	1,468,419	4,689,759	3.19
1957	2,560,245	8,468,614	3.31
1958	2,600,026	8,668,935	3.33

(a) Replaced by classes 8165 and 8175 from 1959

Exports: Fertilizers, except animal, n.o.p., s.c. 8190^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1959	791,280	765,754	.97
1960	214,386	325,770	1.52
1961	181,254	451,145	2.49
1962	..	4,349,394	..
1963	..	23,132,885	..
1964	..	33,881,478	..
1965	..	54,477,839	..

(a) Not available prior to 1959. Beginning in 1961 renumbered as s.c. 416-99, "Fertilizers and fertilizer materials n.e.s."

Exports: Fertilizer materials, n.o.p., s.c. 8195^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	Unit <u>Value</u> \$/cwt.
1954	249,245	148,372	.60
1955	122,317	146,209	1.20
1956	93,336	72,792	.78
1957	68,883	80,226	1.16
1958	101,102	106,203	1.05

(a) Not available prior to 1954. Beginning in 1959 included in s.c. 8190

Exports: Ammonium nitrate, s.c. 416-44^(a)

<u>Year</u>	<u>Value</u> \$
1962	11,630,234
1963	13,144,024
1964	11,011,723
1965	10,196,487

(a) Not available prior to 1962

Exports: Animal manures n.e.s., s.c. 416-09^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	Unit <u>Value</u> \$/cwt.
1961	519	10,391	20.02
1962	473	9,650	20.40
1963	683	13,982	20.47
1964	791	14,077	17.80
1965	634	9,651	15.22

(a) Not available prior to 1961

APPENDIX IIPrincipal Relevant Recommended Items

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
R-7	208 - Argols Arsenic sulphides, natural Boric acid, crude natural Copper, crude precipitate of Sodium borates, crude natural, and concentrates thereof, calcined or not	Free	Free	Free
R-31	663b - Goods which enter into the cost of manufacture of fertilizers when imported for use exclusively in the manufacture of fertilizers	Free	Free	Free
28.10	Phosphorus pentoxide and phosphoric acids (meta-, ortho- and pyro-)	Free	15	25
28.16	Ammonia, anhydrous or in aqueous solution	10	15	25
28.18	Oxides, hydroxides and peroxides, of strontium or barium; hydroxides and peroxides of magnesium; oxides of magnesium, howsoever produced, not less than 94 per cent pure			
	(1) Other than the following	Free	15	25
	(2) Magnesium oxide, howsoever pro- duced, not less than 94 per cent pure	Free	Free	Free
28.38	Sulphates (including alums) and persulphates:			
	(1) Other than the following	Free	15	25
	(2) Aluminum ammonium sulphate, not calcined	Free	10	15
	(3) Aluminum potassium sulphate, not calcined	Free	10	15
	(4) Aluminum sodium sulphate, not calcined	Free	10	15
	(5) Aluminum sulphate, basic or normal	Free	10	15
	(6) Barium sulphate	Free	10	15
	(7) Calcium sulphate	Free	Free	Free
	(8) Chromium potassium sulphate	Free	Free	10
	(9) Chromium sulphate, basic	Free	Free	10

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
28.38 (Cont'd)	(10) Cobalt sulphate, other than pharmaceutical and A.R. grades	10	15	25
	(11) Cupric sulphate	Free	10	15
	(12) Ferrous sulphate			
	(i) exsiccated U.S.P.	10	15	25
	(ii) other	Free	10	15
	(13) Lead sulphate, tribasic	10	15	25
	(14) Magnesium sulphate, dried pure powder	10	15	25
	(15) Nickel sulphate of technical or commercial grade	10	15	25
	(16) Potassium sulphate containing, in the dry state, more than 52 per cent by weight of K ₂ O			
	(i) not less than 99 per cent pure	10	15	25
	(ii) less than 99 per cent pure	Free	Free	Free
	(17) Sodium sulphate, acid (sodium hydrogen sulphate)	Free	Free	Free
	(18) Sodium sulphate, neutral	10	15	25
28.39	Nitrites and nitrates:			
	(1) Other than the following	Free	15	25
	(2) Bismuth subnitrate (basic bismuth nitrate)	10	15	25
	(3) Cobalt nitrate other than A.R. grade	10	15	25
	(4) Potassium nitrate	Free	Free	Free
	(5) Sodium nitrate containing, in the dry state, more than 16.3 per cent by weight of nitrogen	Free	Free	Free
	(6) Sodium nitrite	Free	12½	25
	(7) Strontium nitrate	Free	Free	Free
28.40	Phosphites, hypophosphites and phos- phates:			
	(1) Other than the following	Free	15	25
	(2) Lead phosphite, dibasic	10	15	25
	(3) Sodium hexametaphosphate	10	15	25
	(4) Sodium phosphate, dibasic, pharmacopoeial grade	10	15	25
	(5) Sodium phosphate, monobasic, pharmacopoeial grade	10	15	25
	(6) Sodium phosphate, tribasic, commercial grade	10	15	25
	(7) Sodium pyrophosphate, normal, other than A.R., C.P. and pharmacopoeial grades	10	15	25
	(8) Sodium tripolyphosphate	10	15	25
28.48	Other salts and peroxysalts of inorganic acids, but not including azides:			
	(1) Other than the following	Free	15	25

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
28.48 (Cont'd)	(2) Ammonium nickel sulphate, technical or commercial grade	10	15	25
	(3) Ammonium zinc chloride	10	15	25
28.58	Other inorganic compounds (including distilled and conductivity water and water of similar purity); amalgams, except amalgams of precious metals:			
	(1) Other than the following	Free	15	25
	(2) Amalgams, except amalgams of precious metals	15	20	25
	(3) Calcium cyanamide containing, in the dry state, more than 25 per cent by weight of nitrogen	Free	Free	Free
	(4) Cyanogen bromide	Free	Free	Free
29.25	Amide-function compounds:			
	(1) Other than the following	Free	15	25
	(2) Acetaminophen (p-acetamidophenol)	10	15	25
	(3) N,N-Diethyl-m-toluamide	10	15	25
	(4) Lauric diethanolamide	10	15	25
	(5) Lauric isopropanolamide (lauryl isopropanolamide)	10	15	25
	(6) Lauric monoethanolamide	10	15	25
	(7) Meprobamate (2-methyl-2-n-propyl- 1,3-propanediol dicarbamate)	10	15	25
	(8) Methocarbamol (3(-ortho-methoxy- phenoxy)-1,2-propanediol-1- carbamate)	10	15	25
	(9) N-1-Naphthylphthalamic acid	10	15	25
	(10) Oleic diethanolamide	10	15	25
	(11) Oleic monoethanolamide	10	15	25
	(12) Sodium N-methyl-N-oleoyl taurate	10	15	25
	(13) Stearyl diethanolamide	10	15	25
	(14) Urea containing, in the dry state, more than 45 per cent by weight of nitrogen, whether or not coated or prilled	Free	Free	Free
31.00	Fertilizers and certain enumerated goods:			
	(1) Fertilizers, formulated; goods for use as fertilizers; all the fore- going whether or not otherwise provided for in this item or else- where in Schedule A	Free	Free	Free
	(2) The following, when not for use as fertilizers:			
	Ammonium nitrate, whether or not coated or prilled			
	Ammonium phosphates containing, in the dry state, not less than 6 mg. of arsenic per kg.			

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
31.00 (Cont'd)	Ammonium sulphate			
	Ammonium sulphonitrate			
	Bone ash			
	Bone dust			
	Calcium cyanamide (cyanamid, lime nitrogen) containing, in the dry state, not more than 25 per cent by weight of nitrogen whether or not treated with oil			
	Calcium hydrogen phosphate (calcium phosphate dibasic) containing in the dry state, not less than 0.2 per cent by weight of fluorine			
	Calcium nitrate containing, in the dry state, not more than 16 per cent by weight of nitrogen			
	Calcium nitrate - magnesium nitrate			
	Calcium phosphates, disintegrated (calcined), (thermophosphates and fused phosphates)			
	Charred bone			
	Fish offal or refuse			
	Magnesium sulphate - potassium sulphate containing not more than 30 per cent by weight of K ₂ O			
	Mineral potash			
	Phosphate rock			
	Potassic sodium nitrate			
	Potassium chloride, but not including cultured crystals weighing not less than 2½ grammes each			
	Potassium sulphate containing, in the dry state, not more than 52 per cent by weight of K ₂ O			
	Sodium nitrate containing, in the dry state, not more than 16.3 per cent by weight of nitrogen			
	Superphosphates (single, double or triple)			
	Tankage			
	Urea containing, in the dry state, not more than 45 per cent by weight of nitrogen, whether or not coated or prilled	Free	Free	Free
38.02	Animal black (for example, bone black and ivory black), including spent animal black	Free	Free	Free

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
38.19	Chemical products and preparations of the chemical and allied industries (not including those consisting of mixtures of natural products other than compounded extenders for paints), n.o.p.; residual products of the chemical or allied industries, n.o.p.; not including soap nor pharmaceutical, flavouring, perfumery, cosmetic or toilet preparations:			
	(1) Other than the following	10	15	25
	(2) Alkyl aryl hydrocarbons, unsulphonated reaction blends	5	10	25
	(3) Anti-freezing compounds	15	15	25
	(4) Blends of tall oil and tall oil pitch without other admixture	Free	Free	25
	(5) Catalyst preparations for cracking petroleum, other than the fluid-bed type	Free	Free	25
	(6) Coal tar dye intermediates in solvents	Free	Free	15
	(7) Fusel oil	Free	Free	15
	(8) Hydrolized animal matter for use as retarder	10	10	25
	(9) Mixtures of ethylene glycol and other glycols in which ethylene glycol predominates, for use in the manufacture of anti-freezing compounds	10	10	25
	(10) Naphthenates of aluminum, barium, calcium and chromium	Free	15	25
	(11) Residual lyes from the manufacture of wood pulp by the alkali or sulphate processes and their skimmings, dried or not	Free	Free	25
	(12) Tin-based stabilizers for synthetic resins	Free	Free	25

Portion of
Duty Payable
as Drawback

<u>Goods</u>	<u>When Subject to Drawback</u>	
R-43 1046 - Materials	When used in the manufacture of goods entitled to entry under Recommended Item R-31 663b when such goods are sold to manufacturers to be used as specified in said item	99 p.c.

CA1FN 55

-57 R20



CANADA

Report by
THE TARIFF BOARD

Relative to the Inquiry Ordered
by the Minister of Finance
respecting

CHEMICALS



VOLUME 11

**TANNING AND COLOURING AGENTS, PAINTS, ETC., DRIERS,
FILLERS AND INKS, IN HEADINGS**

25.09 and 32.01 to 32.13

OF THE BRUSSELS TARIFF NOMENCLATURE

LIBRARY

DEC - 7 1967

UNIVERSITY OF TORONTO

Reference No. 120



Report by
THE TARIFF BOARD

Relative to the Inquiry Ordered
by the Minister of Finance
respecting

CHEMICALS



VOLUME 11

**TANNING AND COLOURING AGENTS, PAINTS, ETC., DRIERS,
FILLERS AND INKS, IN HEADINGS
25.09 and 32.01 to 32.13
OF THE BRUSSELS TARIFF NOMENCLATURE**



Reference No. 120

© Crown Copyrights reserved

Available by mail from the Queen's Printer, Ottawa,
and at the following Canadian Government bookshops:

HALIFAX
1735 Barrington Street

MONTREAL
Æterna-Vie Building, 1182 St. Catherine Street West

OTTAWA
Daly Building, Corner Mackenzie and Rideau

TORONTO
221 Yonge Street

WINNIPEG
Mall Center Building, 499 Portage Avenue

VANCOUVER
657 Granville Street

or through your bookseller

Price \$2.25 Catalogue No. FT4-120/11

Price subject to change without notice

ROGER DUHAMEL, F.R.S.C.
Queen's Printer and Controller of Stationery
Ottawa, Canada
1967

THE TARIFF BOARD

L.C. Audette, Q.C.	Chairman
G.H. Glass	First Vice-Chairman
F.L. Corcoran, Q.C.	Second Vice-Chairman
G.A. Elliott	Member
E.C. Gerry	Member
Léo Gervais	Member
A. DeB. McPhillips	Member

J.E. Gander
Director of Research

R.F. Lalonde
Secretary

PANEL FOR THIS INQUIRY

L.C. Audette, Chairman
F.L. Corcoran
G.A. Elliott
Léo Gervais

ECONOMIST

M. Rachlis

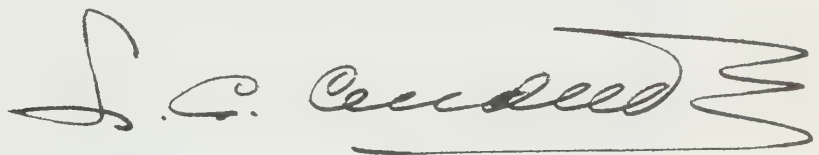
The Honourable Mitchell Sharp, P.C., M.P.
Minister of Finance
Ottawa

Dear Mr. Sharp:

I refer to Mr. Harris' letter of September 21, 1956 and to Mr. Fleming's letters of October 11, 1957 and December 21, 1959 in which the Tariff Board was requested to conduct an inquiry respecting chemicals.

In conformity with Section 6 of the Tariff Board Act, I have the honour to transmit Volume 11 of the Report of the Board, in English and in French. This volume contains the report on dyes, paints, inks, fillers in Headings 25.09 and 32.01 to 32.13 of the Brussels Tariff Nomenclature. Further volumes will be forwarded to you as soon as they have been completed.

Yours sincerely,

A handwritten signature in dark ink, appearing to read "J.C. Caudwell", followed by a long, horizontal, wavy flourish.

Chairman

Explanation of Symbols Used

- Denotes zero or none reported
- .. Indicates that figures are not available
- * In statistical tables, indicates a reported figure which disappears on rounding, or is negligible
- (a) A small letter in brackets denotes a footnote to a table
- (1) A number in brackets denotes a footnote to the text
- s.c. Denotes a Dominion Bureau of Statistics import or export statistical class

The sum of the figures in a table may differ from the total, owing to rounding

A Note on the Organization of the Report - Reference 120

The first four volumes of the Report by the Tariff Board respecting Reference 120, Chemicals, relate to the reference as a whole; the eleven volumes which follow (Volumes 5 to 15, inclusive) relate to the products which were the subject of the Board's inquiry. The principal subject matter of each of the volumes is given below in terms of the headings of the Brussels Tariff Nomenclature (B.T.N.). Occasionally, chemicals of different B.T.N. headings are dealt with together, for example, chlorine (28.01) and caustic soda (28.17); the more detailed tables of contents of the individual volumes indicate where this occurs.

To the extent that particular statistical tables could be related to specific products or B.T.N. headings they are included in the statistical appendix of the volume which deals with that product or heading. Some tables, which could be related only to broader groupings of chemicals, are included in the statistical appendix to the last volume dealing with such broader groupings: inorganic chemicals in Volume 7, organic chemicals in Volume 9 and artificial resins and plastics in Volume 15.

Because of the unprecedented amplitude and complexity of Reference 120 - Chemicals, many parts of Volumes 5 to 15 were written a considerable time before the first four volumes. This gives rise, occasionally, to apparent discrepancies, attributable to the passage of time, particularly between Volume 4 and those which follow.

Table of Contents for Volumes 1 to 15, inclusive

General Volumes

Volume

1	Recommended Schedule
2	Goods in Recommended Items
3	Goods in Existing Items
4	General Considerations; Summary and Conclusions

Reports on Products

Volume

General Description

B.T.N. Headings

5	Inorganic Chemicals	25.01, 25.03, 28.01 to 28.17, and 28.54
6	Inorganic Chemicals	26.03 and 28.18 to 28.34
7	Inorganic Chemicals	25.32 and 28.35 to 28.58
8	Organic Chemicals	15.10, 15.11, 22.08, 22.09 and 29.01 to 29.13
9	Organic Chemicals	15.10 and 29.14 to 29.45
10	Fertilizers	Chapter 31
11	Dyes, Paints, Inks, Fillers	25.09 and 32.01 to 32.13
12	Detergents; Explosives	34.02, 36.01, 36.02
13	Misc. Chemicals & Preparations	37.08 and 38.02 to 38.19
14	Artificial Resins & Plastics	39.01 and 39.02
15	Artificial Resins & Plastics; Other Portions of Reference 120	39.03 to 39.07 -

Table of Contents of Volume 11*

	<u>Page</u>
Introduction	11
Tanning Preparations and Related Products - <u>32.01 to 32.03</u>	13
Tanning Extracts of Vegetable Origin - <u>32.01</u>	13
Tannins (Tannic Acids) and Their Salts, Ethers, Esters and Other Derivatives - <u>32.02</u>	14
Synthetic Tanning Substances; Artificial Bates - <u>32.03</u>	15
Colouring Agents of Headings <u>25.09 and 32.04 to 32.08</u>	19
Introduction	19
Colouring Matter of Vegetable Origin (Excluding Indigo) Or of Animal Origin - <u>32.04</u>	20
Synthetic Organic Dyestuffs; Synthetic Organic Products of a Kind Used as Luminophores; Optical Bleaching Agents, Substantive to the Fibre; Natural Indigo - <u>32.05</u>	22
Colour Lakes - <u>32.06</u>	26
Other Colouring Matter; Inorganic Products of a Kind Used As Luminophores - <u>32.07</u>	27
Earth Colours, Whether or Not Calcined or Mixed Together; Natural Micaceous Iron Oxides - <u>25.09</u> (also see 28.23)	32
Prepared Pigments, Opacifiers and Colours; Vitrifiable Enamels and Glazes, Liquid Lustres and Similar Products, of the Kind Used in the Ceramic, Enamelling and Glass Industries; Engobes (Slips); Glass Frit and Other Glass, in the Form of Powder, Granules or Flakes - <u>32.08</u>	35
Tariff Considerations	35
Varnishes and Lacquers; Distempers; Prepared Water Pigments of the Kind Used for Finishing Leather; Paints and Enamels; Pigments in Linseed Oil, White Spirit, Spirits of Turpentine, Varnish or Other Paint or Enamel Media; Stamping Foils; Dyes in Forms or Packings of a Kind Sold by Retail - <u>32.09</u>	60
Artists', Students' and Signboard Painters' Colours, Modifying Tints, Amusement Colours and the Like, In Tablets, Tubes, Jars, Bottles, Pans or in Similar Forms or Packings, Including Such Colours in Sets or Outfits, With or Without Brushes, Palettes or Other Accessories - <u>32.10</u>	80
Prepared Driers - <u>32.11</u>	83
Glaziers' Putty; Grafting Putty; Painters' Fillings, and Stopping, Sealing and Similar Mastics, Including Resin Mastics and Cements - <u>32.12</u>	85
Writing Ink, Printing Ink and Other Inks - <u>32.13</u>	92

Appendices

I	Statistics	103
II	Principal Relevant Recommended Items	187

* The numbers shown after product designations are those used in the
Brussels Tariff Nomenclature

TANNING AND DYEING EXTRACTS; TANNINS AND THEIR DERIVATIVES; DYES, COLOURS, PAINTS AND VARNISHES; PUTTY, FILLERS AND STOPPINGS; INKS -
B.T.N. CHAPTER 32, AND EARTH COLOURS; IRON OXIDES - HEADING 25.09

INTRODUCTION

This volume deals with the goods classified in Chapter 32 and heading 25.09 of the Brussels Nomenclature. Chapter 32 relates to preparations used in the tanning and bating of hides and skins; colouring matter of vegetable, animal or mineral origin; synthetic organic dyestuffs; preparations made from these colouring materials (paints, varnishes, ceramic colours, inks, etc.); preparations such as driers, putties and other sealants. Heading 25.09 relates to earth colours and natural micaceous iron oxides. Chapter 32 generally excludes chemically defined elements and compounds, even though they may be used for the same purposes as the preparations under discussion; heading 25.09 excludes iron ores and natural ferrous earth colours containing 70 per cent or more by weight of combined iron evaluated as Fe_2O_3 .

In Chapter 32, headings 32.01, 32.02 and 32.03 relate to tanning materials; headings 32.04, 32.05, 32.06, 32.07 and 32.08 provide for colouring materials of various kinds; headings 32.09, 32.10 and 32.13 provide for finished goods in whose manufacture the colouring materials of earlier headings are used; and headings 32.11 and 32.12 provide for prepared driers and putty and fillers, respectively.

It is difficult to establish, with any degree of precision, the size of the Canadian market for the products of Chapter 32. The difficulties include the lack of sufficient detail to permit exclusion of unrelated goods; overstatement of magnitudes because of double counting, as for example, of the pigments used in the manufacture of paints; and understatement because the total exclusion of intermediate products takes no account, for example, of dyestuffs sold to textile or plastic manufacturers. In view of the foregoing, the estimates of the size of the Canadian market should be regarded as approximations; they are intended to show only general relationships.

Estimated Canadian Market for Goods of B.T.N. Chapter 32, 1964

Description & <u>B.T.N. Headings</u>	Canadian <u>Shipments</u>	<u>Imports</u>		<u>Total</u>
		<u>B.P.</u>	<u>M.F.N.</u>	
	- million dollars -			
<u>Tanning Preparations</u>				
32.01, 32.02, 32.03	..	0.2	1.4	1.5
<u>Colouring Materials</u>				
32.04, 32.05, 32.06, 32.07, 32.08	5.0	3.0	26.8	29.8
<u>End-Products</u>				
Paints, Varnishes, etc., 32.09	181.6	0.1	5.6	5.7
Printing & Other Inks, 32.13	22.8	0.4	2.0	2.4
Artists' Colours, Driers, Fillers, 32.10, 32.11, 32.12	<u>2.6</u>	<u>0.5</u>	<u>3.1</u>	<u>3.6</u>
Total	212.0	4.2	38.9	43.0

Source: D.B.S., various publications

Exclusive of the colouring materials of headings 32.04 to 32.08, (which are largely included again in the value of shipments of end products), it is estimated that, in 1964, the Canadian market for identifiable goods of Chapter 32 had a value of approximately \$225 million of which about 80 per cent was supplied by domestic production. Imports, in total, were valued at \$43 million of which \$19 million were tanning materials, dyes and other colouring materials which are mostly not available from Canadian manufacturers and \$24 million which were generally of types of products made in Canada. Thus, Canadian producers supplied about 90 per cent of the domestic market for the kind of products which they produced.

The decorative and protective coatings of heading 32.09 are by far the most important goods under consideration. Excluding again the basic materials of headings 32.04 to 32.08, the coatings of heading 32.09 account for more than 80 per cent of the value of Canadian use of all of the identifiable goods classified in Chapter 32 and Canadian shipments of them for more than 85 per cent of Canadian shipments of all of the end products. More than 95 per cent of Canadian use of these decorative coatings is supplied by domestic production.

The organic and inorganic colouring agents of headings 32.05 and 32.07 account for a large part of total imports, about 60 per cent in 1964. Canadian shipments of all colouring agents are estimated at only \$5 million, less than 15 per cent of Canadian consumption. Tanning preparations are also largely imported; printing and writing inks are supplied mainly from Canadian production.

Exports are relatively small, around \$2 million, annually. They consist mainly of inorganic colouring materials, paints and varnishes, and fillers.

About 90 per cent of the total of imports is from M.F.N. countries, and a large proportion (72 per cent) originates in the U.S.A. The B.P. imports originate almost entirely in the U.K. Tanning agents and synthetic organic colouring materials are mainly not made in Canada and most are entered free of duty. Dutiable imports consist mostly of inorganic colouring materials, for example, extended titanium dioxide, and finished goods, such as paints, lacquers, sealing compounds and inks. The duty collected, in 1964, on dutiable imports of colouring materials, mostly inorganic materials of heading 32.07, was equivalent to 12.7 p.c., B.P. and 13.6 p.c., M.F.N.; on imports of end-products of headings 32.09 to 32.13, the duty was equivalent to 13 p.c., B.P. and 18 p.c., M.F.N. of the value of dutiable imports.

In general, producers of the goods classified in Chapter 32 proposed rates of 15 p.c., B.P. and 20 p.c., M.F.N. for preparations of a kind made in Canada and agreed that ingredients which are not made in Canada, or directly competitive with made-in-Canada products, could be free of duty.

Each of the categories of products is discussed in some detail in the sections which follow.

TANNING PREPARATIONS AND RELATED PRODUCTS
B.T.N. HEADINGS 32.01, .02, .03

The Products

The principal products classified under B.T.N. headings 32.01, 32.02 and 32.03 are tanning preparations of vegetable origin, tannins (tannic acids), synthetic tanning preparations and artificial bates. Chemically defined elements or compounds that may be used as tanning agents, such as basic chromium sulphate, are excluded from Chapter 32; they are generally classified in Chapters 28 and 29 and are discussed under their relevant headings.

In general, the preparations classified in B.T.N. headings 32.01, 32.02 and 32.03 are used in the tanning and bating of hides and skins. The headings are reproduced below, for convenience.

32.01 Tanning extracts of vegetable origin.

32.02 Tannins (tannic acids), including water-extracted gall-nut tannin, and their salts, ethers, esters and other derivatives.

32.03 Synthetic tanning substances, whether or not mixed with natural tanning materials; artificial bates for pre-tanning (for example, of enzymatic, pancreatic or bacterial origin).

The tanning preparations of heading 32.01 often are extracted with warm water from vegetable material; the tannins of heading 32.02 are obtained by extraction with ether or alcohol from either the raw vegetable materials or from the extracts of heading 32.01. The tanning products covered by heading 32.03 include synthetic organic tanning substances ("syntans") and synthetic inorganic tanning products ("mineral tannins"). The artificial bates of the heading are complex preparations used to facilitate the removal of the interfibrillary protein and the lime from the scraped skins to make them more susceptible to the subsequent action of the tanning materials.

The total Canadian consumption of the tanning and related products under consideration is valued at about \$1.8 million, almost all of which is supplied by imports. Slightly more than half the total value is of preparations of vegetable origin. The principal categories of tanning and related preparations are discussed in greater detail under the separate headings following.

Tanning Extracts of Vegetable Origin - B.T.N. 32.01

These are generally extracted with warm water from the wood, bark and other ground and shredded parts of vegetable material. They contain varying proportions of tannins, the main active constituent. Most of the vegetable tanning extracts are liquids, although some may be further concentrated into paste or solid form. Although the vegetable extracts encounter competition from synthetic tanning agents, they nevertheless constitute the largest category of tanning preparations under consideration in this section.

In recent years, the value of Canadian consumption of vegetable tanning extracts has averaged about one million dollars annually. Quebracho extract, imported mostly from South America, is the most important of these, accounting for more than one-half of the total; chestnut extract, mostly from France and Italy, and wattle, (or mimosa) extract from South Africa are the other principal vegetable tanning agents currently in use. Vegetable tanning extracts are not available from Canadian manufacturers at the present time.(1)

Tanning Extracts Used by Leather Tanneries, 1961-63

	<u>1961</u>	<u>1962</u> - \$'000 -	<u>1963</u>
Chestnut	142	143	161
Quebracho	448	526	573
Wattle	129	150	155
Other	<u>115</u>	<u>101</u>	<u>120</u>
Total	834	920	1,009

Source: D.B.S., Leather Tanneries, Cat. No. 33-202

Tannins (Tannic Acids), Their Salts and Other Derivatives -
B.T.N. 32.02

Tannic acids, or tannins, are the main active constituents of the vegetable tanning extracts discussed above. They are obtained by extraction with alcohol or ether, either from the vegetable extracts classified in heading 32.01 or from the raw vegetable materials. The heading also includes water-extracted gall-nut extracts. Tannic acids usually are in the form of amorphous powders, glistening scales, needle-like crystals or spongy mass; they may vary considerably in the degree of purity. Gallo-tannic acid, extracted from gall-nuts, is the most common of all tannins; others are derived from oak bark, chestnut wood, quebracho, wattle and other tannin-bearing plant materials. Tannins are used principally as mordants in the dyeing of textiles, as clarification agents in the manufacture of wine and beer, in the manufacture of inks and synthetic rubber, and in pharmacy and photography.

The tannates include salts, ethers and esters such as those of aluminum, bismuth, calcium, iron, manganese, mercury and zinc; also included are derivatives of tannic acid such as acetyl-tannin and methyleneditannin. The heading excludes tannates and other tannin derivatives of precious metals and their compounds, derivatives of provitamins, vitamins, vegetable alkaloids and antibiotics, and of proteins; these are generally classified in headings 28.49 to 28.52, 29.38 to 29.42 and 29.44. It also excludes gallic acid (heading 29.16) and synthetic tanning substances (heading 32.03). The derivatives that are classified here are reported to be used mostly in the manufacture of pharmaceuticals.

(1) Transcript, Vol. 95, p. 14433, 14439-40

From the available information it appears that tannic acids and the derivatives under discussion are either not made in Canada at the present time, or, if made, their production is not of great commercial importance. Imports of tannic acid in recent years have varied between \$40,000 and \$60,000 annually. The U.S.A. has been a major source of supply; imports also come from France, the Benelux countries and Britain. No information is available concerning imports of the tannin derivatives.

Synthetic Tanning Substances; Artificial Bates - B.T.N. 32.03

Synthetic organic tanning preparations (syntans) can be used alone to tan leather to a pale colour, but are more frequently mixed or used in conjunction with vegetable or mineral tanning materials to assist their penetration into the skins. In recent years, consumption of synthetic tanning preparations by Canadian leather tanneries has averaged about \$300,000 annually. The Board was informed that these were imported, though there is evidence that Canadian Aniline & Extract Co., Limited, of Hamilton, Ontario, manufactures one type of syntan, described as a sodium formaldehyde naphthalene sulphonate.⁽¹⁾

Synthetic inorganic tanning products (mineral tannins) are preparations based on chromium, aluminum, iron or zirconium salts. They are usually employed alone, although at times they may be mixed with syntans or vegetable tanning extracts of headings 32.01 or 32.03. Such mixtures are classified in heading 32.03. The mineral, or inorganic, tanning agents have almost entirely replaced vegetable extracts in the tanning of light hides and skins such as those for use in shoe uppers, handbags and gloves. The value of consumption by Canadian leather tanneries of chromium-based tanning preparations increased from some \$230,000 a year in the early 1950's to approximately \$500,000 in 1964. None of these apparently is available from domestic production.

Artificial bates are complex preparations usually based on materials of enzymatic, pancreatic or bacterial origin. They are normally applied prior to tanning and are designed to facilitate the removal of undesirable materials from the skins, softening them and rendering them more susceptible to the subsequent action of tanning agents. The evidence suggests that artificial bates are not commercially significant in Canada.⁽²⁾

Tariff Considerations

The tanning preparations and related products of headings 32.01, 32.02 and 32.03 are entered mainly under the tariff items listed below, except for entry under end-use items.

⁽¹⁾ Transcript, Vol. 95, p. 14433, 14439-40; Vol. 96, p. 14525, 14534

⁽²⁾ Same, Vol. 96, p. 14518, 14520

	<u>Tariff Item No.</u>	<u>Rates of Duty B.P.</u>	<u>M.F.N.</u>
<u>B.T.N. 32.01</u>			
Tanning extracts of vegetable origin	203	Free	Free
<u>B.T.N. 32.02</u>			
Tannic acids (tannins)	203	Free	Free
	208	Free	Free
Derivatives of tannic acids	208t	Free	15 p.c.
<u>B.T.N. 32.03</u>			
Synthetic tanning substances	203a	Free	Free
Mineral tanning preparations	203a	Free	Free
Artificial bates	220a(i)	15 p.c.	20 p.c.
	711	15 p.c.	20 p.c.

Thus, with the exception of tannin derivatives and artificial bates, whose commercial significance is believed to be small, all of the other products under discussion at present qualify for duty-free entry under both the British Preferential and the Most-Favoured-Nation Tariffs.

The Industry Committee proposed the adoption of the relevant B.T.N. headings for classification of products.

Most of the tanning extracts of vegetable origin of B.T.N. heading 32.01 are at present provided for in tariff item 203; to this extent, heading 32.01 and, to a lesser extent, heading 32.02 would simply replace the relevant portions of the existing item. Tannic acid is specifically provided for in item 208, duty-free under all Tariffs. Tannins adapted for use in dyeing or tanning are also free of duty under tariff item 203, but the derivatives of tannins are entered mostly under item 208t, at Free, B.P., 15 p.c., M.F.N.

However, tariff item 203 also provides for certain seeds, beans, nuts, berries and other parts of plants when adapted for dyeing and tanning; these are not classified in Chapter 32 of the B.T.N.

The mineral tannins and synthetic tanning substances of heading 32.03 appear to be entered mostly under item 203a. Heading 32.03 also provides for artificial bates, entered under items 220a(i) and 711 and probably some other products entered under these two items and item 208t, though these products and the artificial bates seem to be of little commercial importance in Canada.

The Committee made no proposal respecting the raw vegetable materials used in the preparation of vegetable extracts, nor did anyone else. As vegetable tanning extracts are not at present manufactured in Canada, the raw materials for use in their manufacture are not likely to be imported. Under the Brussels Nomenclature, such materials are provided for in heading 13.01. The use of B.T.N. Chapter 32 as the basis for new tariff items therefore will require that provision be made for these residual portions of existing tariff item 203.

In a joint submission, Nopco Chemical Canada Limited and its subsidiary, Canadian Aniline & Extract Company, Limited, requested the deletion of existing item 203a and supported the adoption of the B.T.N. classification for the relevant products. The companies proposed that a new item, worded like B.T.N. heading 32.03, should bear rates of 15 p.c., B.P. and 20 p.c., M.F.N. Canadian Aniline & Extract has been manufacturing, in Hamilton, a type of synthetic tanning preparation described as sodium formaldehyde naphthalene sulphonates. This product was previously imported for re-sale from its parent company in the U.S.A. The Canadian company noted that it was at a disadvantage in comparison to manufacture in the United States because of the smaller market in Canada and the higher cost of materials. It claimed that deletion of item 203a "would definitely encourage the production in Canada of a full line of these products."⁽¹⁾ The company suggested that anyone having an interest in any product now entered under item 203a, and which is not made in Canada, can propose lower rates for it until it is made in Canada; by the company's proposal, when products are ruled made in Canada, rates of 15 p.c., B.P. and 20 p.c., M.F.N. would apply. Nopco proposed duty-free entry for certain materials which it now imports under tariff item 203a.

Nopco's submission was supported by confidential information on comparative costs in Canada and the United States of raw materials used in the manufacture of the syntan made by Canadian Aniline & Extract. This information showed the prices of the materials were considerably higher in Canada than in the United States. More recent information, requested by the Board, suggests that this differential has narrowed somewhat. Most of the raw materials used in large quantity can be imported duty-free, or at relatively low rates of duty, and the two companies asked for continued duty-free entry of several intermediate products used in the manufacture of syntans, said not to be available in Canada.

The Board did not attempt to assess the extent of the disadvantage attributable to the smaller scale of output. However, it seems reasonable to assume that there are some offsetting advantages, leading to the company's decision to cease importation and to undertake production in Canada; for example, the equipment used for the batch process was said to be used also for the production of other products.

With the exception of the syntan manufactured by Nopco, the Board has no indication that other mineral and synthetic tanning agents are at present manufactured in Canada.

The Tanners Association of Canada requested that tariff items 203, 203a, as well as certain others relating to products of interest to the Association, be retained without any change that would result in an increase in the rates of duty on the products now imported under them. However, the Association stated that it would not oppose changes in the wording or grouping of tariff items designed to bring them into conformity with the Brussels Nomenclature.⁽²⁾

(1) Transcript, Vol. 96, p. 14526

(2) Same, Vol. 95, p. 14418

In its written submission to the Board, the Association supported its request for continued free entry on the grounds that "Not one tanning agent capable of producing the leather acceptable to either domestic or foreign users can be obtained from Canadian sources." Members of the Association were reported to have accounted for 88 per cent of the total value of leather shipped from Canadian tanneries in 1960.

Published information suggests that the tanning preparations under consideration accounted for about six per cent of the total value of all materials used by Canadian tanneries in 1963; the synthetic and chrome agents alone accounted for about two per cent. For materials other than hides and skins, the tanning preparations represented 18 per cent of the value of materials and supplies.

The Wattle Export Development Division of the African Territories Wattle Industry Fund Limited urged the continued duty-free entry of wattle extract, at present imported under tariff item 203. The members of the Fund are said to supply virtually all of the wattle extract imported into Canada. Among the reasons for continued duty-free entry the submission noted that tanning extracts were not produced in Canada and that the imposition of a duty on wattle extract would place Canadian tanners at a disadvantage in relation to leather manufacturers abroad.⁽¹⁾ Imports of wattle extracts were valued at \$180,000 in 1964.

The Canadian Pulp and Paper Association expressed an interest in tannic acid. In a general submission, the Association urged that there be no increase in rates of duty on materials used by its members.⁽²⁾

The spokesman for the Industry Committee stated that the Committee did not object to continued duty-free entry of vegetable tanning extracts and of the related tannins and their derivatives, as these products were not made in Canada and nobody had shown an interest in making them.⁽³⁾ However, for the mineral and synthetic tanning preparations and the artificial bates covered by B.T.N. heading 32.03, the Committee proposed rates of 15 p.c., B.P. and 20 p.c., M.F.N., on the grounds that these were products of chemical processing.⁽⁴⁾ This proposal would apply to imports valued at about \$600,000 annually, most of which now qualify for duty-free entry under item 203a.

(1) Transcript, Vol. 96, p. 14502-03

(2) Same, Vol. 96, p. 14467; Vol. 36, p. 5246

(3) Same, Vol. 96, p. 14483

(4) Same, Vol. 96, p. 14518

COLOURING AGENTS

B.T.N. HEADINGS 25.09, 32.04, .05, .06, .07, .08INTRODUCTION

This section deals with goods classified in headings 25.09, 32.04 to 32.08 of the B.T.N., variously described as colours, pigments, dyes, dyestuffs, colour lakes and by other related names. With certain exceptions, they include all of the colouring agents used in the manufacture of the products considered in subsequent sections of this B.T.N. Chapter, as well as those used to impart colour to other substances such as cloth, leather, paper, plastics, rubber, foodstuffs, drugs and cosmetics. They also include certain related specialized products such as optical bleaching, luminescent and fluorescent agents and the colouring preparations used in the manufacture of glassware and tableware. Excluded from these headings are separate, chemically defined elements and compounds that may be used as colouring agents, such as titanium dioxide, basic lead carbonate, oxides of iron, lead, chromium or zinc, carbon black and lamp black; all of these are discussed under their appropriate headings in other parts of this report, mostly under headings of B.T.N. Chapters 28 and 29.

The description of goods in the headings here under discussion are:

- 25.09 Earth colours, whether or not calcined or mixed together; natural micaceous iron oxides.
- 32.04 Colouring matter of vegetable origin (including dye-wood extract and other dyeing extracts, but excluding indigo) or of animal origin.
- 32.05 Synthetic organic dyestuffs (including pigment dyestuffs); synthetic organic products of a kind used as luminophores; products of the kind known as optical bleaching agents, substantive to the fibre; natural indigo.
- 32.06 Colour lakes.
- 32.07 Other colouring matter; inorganic products of a kind used as luminophores.
- 32.08 Prepared pigments, prepared opacifiers and prepared colours, vitrifiable enamels and glazes, liquid lustres and similar products, of the kind used in the ceramic, enamelling and glass industries; engobes (slips); glass frit and other glass, in the form of powder, granules or flakes.

Headings 32.04 to 32.08, in general, provide for products of vegetable or animal origin (in 32.04), for synthetic products (in 32.05) and for those of mineral origin (in 32.07). Heading 32.06 provides for colour lakes - preparations obtained by fixation of animal, vegetable or synthetic organic dyestuffs on a base which is generally

mineral; heading 32.08 applies to prepared pigments, opacifiers and a variety of preparations that are used in the ceramics industry, the glass industry and in the colouring or finishing of metal articles.

The Explanatory Notes to the Brussels Nomenclature specify the preparations which are included in each of the headings; the Notes also specify the products which are excluded and classified under other headings of the B.T.N.

Heading 25.09 is dealt with in this section because the earth colours and iron oxides are so closely related in origin and use to the products of Chapter 32, particularly those classified in heading 32.07. This relationship also exists for the Canadian tariff items which apply to the products of headings 25.09, 32.07 and other headings of Chapter 32.

In 1964, the total Canadian market for the colouring agents under consideration was valued at about \$35 million, of which only about \$5 million, or some 15 per cent, was supplied from domestic production. Close to one-half of the total market consisted of synthetic organic dyes all of which are imported. Canadian production consists mostly of inorganic pigments; domestic manufacturers claimed to be supplying between 80 and 85 per cent of the Canadian market for the types of pigments which they manufacture.

Almost two-thirds of the imports in 1964, including all dyes, were entered duty-free, mostly under tariff items 203b and 203c. Most of the inorganic pigments are dutiable, chiefly under tariff item 246 at 12½ p.c., B.P. and 17½ p.c., M.F.N.; some of the other colouring materials, including those for use in colouring or printing textiles and in the manufacture of roofing granules, qualify for duty-free entry under several end-use items. The tariff considerations for all of these headings are dealt with at the end of this section after the presentation of information on the individual headings and products.

Colouring Matter of Vegetable Origin ... Or of Animal Origin,
B.T.N. 32.04

The Explanatory Notes to the Brussels Nomenclature refer to heading 32.04 in the following terms.

"This heading covers the greater part of the products of vegetable and animal origin used mainly as colouring substances. These products are generally extracted from materials of vegetable origin (wood, barks, roots, seeds, flowers, lichens, etc.) or of animal origin, by steeping them in water or in weak acid or ammonia solution or, in the case of certain vegetable materials, by fermentation. They are relatively complex materials and generally contain one or more colouring principles with small quantities of other substances (sugars, tannins, etc.) originating either from the raw materials or resulting from the extraction process. They are included in this heading whether or not they are chemically defined compounds."⁽¹⁾

(1) Explanatory Notes, p. 312

The heading includes colouring and dyeing extracts obtained from wood, barks, roots, seeds or flowers of various plants and trees. Among those of commercial importance in Canada are extracts of turmeric, or curcuma, logwood, fustic and annatto seed; they are used mainly for colouring foodstuffs and in the dyeing of textiles and leather. Various processes, including steeping in water, acid or ammonia solutions and, in some cases, fermentation are used to extract the colouring matter from the various vegetable materials.

One firm in Canada, Dye & Chemical Co. of Canada, Ltd., of Kingston, Ontario, manufactures a colouring extract from imported annatto seeds. All of its output is further processed into food colouring which the company markets in various forms for use in colouring products such as butter, cheese and margarine. Colouring agents of vegetable origin for use in dyeing textiles and leather were reported not to be made in Canada.⁽¹⁾ The import data report food colourings without specifying individual products. In the years 1960-64 imports varied in value between \$550,000 and \$700,000 annually; in 1964, they were valued at \$584,000.

In 1963, the last year for which separate statistics are available, imports of turmeric, logwood, fustic and gambier extracts were valued at \$124,000; turmeric came mostly from India, logwood and fustic chiefly from the United States and gambier and other extracts largely from the U.K. and Germany. Imports of other natural colouring materials, in 1963, were valued at approximately \$135,000.

Heading 32.04 also includes animal colouring substances such as red cochineal and kermes extracts obtained from dried bodies of cochineal and kermes insects, respectively, a brown colour obtained from the ink sac of a species of cuttle fish, and brilliant red colours, the main one being lac dye from the crude lac extruded by the lac insect. Some of these, such as the lac dye, are among the oldest colouring substances known to man. They are now used to a limited extent, mostly in the preparation of dyes, inks, food colouring and as indicators in chemical analysis.

There is no known Canadian manufacture of colouring agents of animal origin, nor do they appear to be commercially significant.

Heading 32.04 excludes lamp black (heading 28.03), substances which in practice are not used for their dyeing properties, such as morin, haematin and haemin (heading 32.05), ivory black and other animal black (heading 38.02) and natural indigo (heading 32.05).

(1) Transcript, Vol. 94, p. 14303; Vol. 95, p. 14442

Synthetic Organic Dyestuffs (including Pigment Dyestuffs); Synthetic Organic Products of a Kind Used as Luminophores; Products of the Kind Known as Optical Bleaching Agents, Substantive to the Fibre; Natural Indigo - B.T.N. 32.05

Heading 32.05 provides for synthetic organic dyestuffs, whether or not chemically defined and whether or not mixed together or diluted with substances which have no dyeing properties. They may have surface-active agents added, or they may be concentrated in rubber, plastics or other media, or be mixed with relatively large quantities of surface-active products or with organic binders. The heading also includes luminophores, optical bleaching agents and natural indigo. The heading excludes separate diazonium salts (Chapter 29), intermediate products which are not themselves dyes (Chapter 29) and substances which in practice are not used for their dyeing properties.

The synthetic, organic colouring agents, which first began to make their appearance on a significant scale during the second half of the previous century, have by now almost entirely replaced natural organic colouring substances in most applications. Because they are manufactured from chemical elements and compounds whose concentration and purity can be readily controlled and varied, the synthetic colouring agents can be produced with greater uniformity and in far greater variety than was obtainable from the use of natural products.

In North America the term "synthetic organic dye" pertains to a colouring agent which is usually soluble in the medium in which it is used. The organic dyes are used mainly for colouring or dyeing textiles, leather, plastic or other materials. The term "organic" pigment, on the other hand, is generally confined to a colouring agent which is substantially insoluble in the medium in which it is used. The pigments are used principally in the manufacture of the decorative and protective coatings and of printing inks. Heading 32.05 applies to both organic dyes and organic pigments. Organic dyes are not known to be made in Canada; some organic pigments are made in Canada.

Practically all of the synthetic dyes currently in use are obtained from aromatic chemical compounds, in particular benzene, toluene, xylene, naphthalene, acenaphthene, anthracene and carbazole. As many of these basic compounds were obtained traditionally from coal tar, synthetic dyes are frequently referred to as coal-tar dyes.

The manufacture of synthetic organic dyes involves a series of chemical processes. First, the basic compounds such as naphthalene are transformed into dye intermediates. This is accomplished by means of a series of relatively simple chemical reactions between the basic materials and various other chemicals such as nitric and hydrochloric acids, caustic soda, sodium carbonate ammonia or chlorine. By varying the processes and ingredients, literally thousands of intermediates can be produced from the few basic materials. However, it has been estimated that 90 per cent of the total tonnage of the synthetic dyes made in the world is derived from less than 200 intermediates. Most of the intermediates are white or colourless; some, particularly those

made from anthracene, are coloured and may themselves be used as dyes. The basic raw materials, comprising the aromatic hydrocarbons and the dye intermediates derived from them, are not under consideration in this volume; most of them are dealt with in the volume of the report pertaining to B.T.N. Chapter 29.

The intermediates are converted into dyes by means of additional chemical processes such as condensation and oxidation. Although the number of types of dyes that have been synthesized runs into hundreds of thousands, less than one thousand are reported to be currently in use throughout the world. Synthetic dyes are classified on the basis of their chemical composition, among the principal ones being azo, anthraquinone and indigoid types. They are also frequently classified according to the method by which they are applied, the principal ones currently in use in Canada being direct, developed, acid and basic dyes.

Apart from their principal use in the dyeing of textiles, synthetic dye materials are also used to impart colour to a wide variety of other substances, including paper, leather, rubber, resins, plastics, oil, gasoline, anti-freeze mixtures, soaps and cosmetics. They are also used in the manufacture of prepared pigments, decorative and protective coatings and printing inks. For these latter uses, the dyes are usually further processed into colour lakes (heading 32.06); these are obtained mostly by precipitating the dye on an inorganic base or carrier, such as barium sulphate, calcium sulphate or aluminum oxide.

Closely related to synthetic dyes are the organic lumino-phores (daylight fluorescent agents) and the optical bleaching agents, or brighteners. The former are synthetic organic substances which, under the action of light rays, produce a luminescent or fluorescent effect. Most of these are not themselves colouring agents, but are added to colouring matter to increase its brilliance. However, some also have the character of colouring matter.

Optical bleaching agents, or brighteners, are synthetic organic products which absorb ultra-violet rays and give off a visible blue radiation which masks the yellow and intensifies the apparent whiteness of the article. Optical brighteners generally consist of stilbene derivatives. A great variety of formulations can be made, about 200 to 250 different types currently being offered on a world-wide basis by some 30 to 40 manufacturers. The principal uses of optical brighteners are in the manufacture of soaps, detergents, paper, textiles and plastics.

Synthetic organic dyestuffs have never been manufactured in Canada on a commercial scale. Imports have been increasing steadily, from some \$6 million annually in the immediate post-war years to more than \$15 million in 1964. Their composition by type and by principal sources of supply in 1964 is shown in the following table.

In the years just before World War II Germany and the U.S.A. were approximately equally important sources of supply of the Canadian market for organic dyes and together supplied about two-thirds of the requirements. Since the war, the U.S.A. has been by far the largest supplier. In 1964, close to 50 per cent, by value, of the imported

Imports of Synthetic Organic Dyestuffs
by Kind and Principal Country of Origin, 1964

Type of Dyestuff	United Kingdom \$'000	United States \$'000	West Germany \$'000	Switzer-land \$'000	Total '000 lb.	Imports \$/lb.
Acid	363	970	392	723	1,580	1.63
Azoic	25	354	189	31	493	1.24
Basic	327	915	816	87	1,331	1.69
Chrome	52	103	101	70	377	.97
Direct and developed	353	1,332	418	613	2,009	1.46
Dispersed (acetate)	99	1,174	320	143	764	2.28
Sulphur	4	127	295	-	839	.55
Vat, incl. indigo	209	423	496	128	485	2.70
Oil, spirit and wax, n.e.s.	239	574	30	15	512	1.71
Food, drug & cosmetic	75	268	4	2	167	2.24
Optical brighteners	50	788	235	205	881	1.45
Dyestuffs, n.e.s. (a)	63	547	96	75	644	1.24
Textile pigments	42	754	316	12	2,168	.52
TOTAL	1,901	8,329	3,708	2,104	12,250	1.36

(a) Adjusted to exclude estimated imports of dye intermediates, Chapter 29

Source: D.B.S., Cat. No. 65-007

dyes originated in the U.S.A. and about 22 per cent in West Germany. Britain and Switzerland supplied 11 per cent and 13 per cent, respectively, of total imports. Only four per cent came from other countries.

The lack of Canadian production, despite the relatively large and growing market, deserves some comment. Between the wars, the world trade in dyes was dominated by a few large companies, located principally in Germany, the United Kingdom, Switzerland and the United States. Apart from pooling their technical knowledge, many of the companies also shared the market on a predetermined basis and under pre-arranged conditions of sale. The Canadian market was covered by such arrangements and was served by firms belonging to the international dye cartel, mostly through jointly operated distribution agencies charged with ensuring that the various stipulations concerning the shares of the market and conditions of sale were observed.⁽¹⁾ The principal producing countries have generally imposed high rates of duty and, from time to time, embargoes on imports; dyes entering Canada, on the other hand, have been entitled, for the most part to duty-free entry or a duty of 10 p.c. ad valorem. These factors, together with the relatively small domestic market in the inter-war period, were perhaps the principal impediments to the establishment of a dye industry in Canada.

In recent years, annual imports of organic dyestuffs have been about four times the \$4 million of imports of pre-war years and have been increasing steadily. Size of market, therefore, is far less of a limiting factor, at least for some of the principal organic dyes, than it was in the earlier years.

Nevertheless, at the public hearing in 1962, a spokesman for the Industry Committee suggested that the manufacture of synthetic dyes in Canada was highly unlikely to materialize in the foreseeable future. The following were among the reasons given in support of this conclusion:

"The total Canadian consumption of dyes amounting to approximately \$10,000,000 comprises 200-300 products. To make these dyes a large number of intermediates would be required which could only be manufactured economically if by-products could be absorbed in the broad pattern of organic chemical manufacturing processes, such as pharmaceuticals, plastics and similar operations.

"Furthermore, it is quite apparent that there is an oversupply of dyes in the world market which would make it extremely difficult for a prospective Canadian manufacturer to compete in his own domestic market let alone participate in world trade dominated by highly industrialized countries with a sizeable domestic textile market and a very diversified and highly developed organic chemical industry."⁽²⁾

(1) For an outline of the cartel arrangements pertaining to dyes see "Canada and International Cartels", Report of Commissioner, Combines Investigation Act, Queen's Printer, Ottawa, 1945, p. 11 - 13

(2) Transcript, Vol. 97, p. 14638-9

As noted earlier, the Canadian market for synthetic dyes is now about \$17 million. Although much smaller than that enjoyed by producers in the U.S.A., the United Kingdom or Germany, it probably compares favourably with the size of the domestic market in some other countries, such as Belgium and Switzerland, which have a sizable dye industry. The manufacture of synthetic dyes is closely related to the manufacture of other organic chemicals utilizing similar processes and many of the same raw materials. As noted later in this section, some synthetic organic pigments are being manufactured in Canada successfully on a commercial scale, although their total consumption is below that of synthetic dyes at the present time. Most of the basic materials for organic dyes, including the basic hydrocarbons and the products of the chemical industry which are used in the manufacture of dye intermediates and of the dyes themselves, are either available from domestic sources or can be imported free of duty under the existing tariff provisions. Under these circumstances, it seems reasonable to expect that the manufacture in Canada of some of the types of dyes required in large volume might already be, or might shortly become, economical.

Unlike the dyes, which are almost invariably made from organic substances, synthetic pigments are made from both organic and inorganic compounds. The inorganic pigments are presented principally under heading 32.07 where the method of manufacture applicable to both the organic and inorganic materials is described in a general way.

Among the principal organic pigments are toluidine and lithol reds, benzidine yellows, and phthalocyanine green and blue pigments. As their names suggest, these pigments are based on organic compounds akin to, or identical with, those used in the manufacture of synthetic dyes. The organic pigments are more expensive than the inorganic pigments and range in price from about 90¢ to over \$4.00 per pound. They are generally inferior to inorganic pigments as to light-fastness, heat resistance and tendency to dissolve, or "bleed", in oils and solvents; on the other hand, they are available in brighter and more varied colours. A few substances used principally as organic pigments are made in Canada; these are noted under Tariff Considerations at the end of this part of the report.

Natural indigo is referred to in the Tariff Considerations at the end of this part of the report.

Colour Lakes - B.T.N. 32.06

The Explanatory Notes to the Brussels Nomenclature define colour lakes as follows.

"Colour lakes are preparations insoluble in water, obtained by fixation of natural colouring matter (animal or vegetable) or synthetic organic dyestuffs (whether or not soluble in water), on a base, generally mineral (barium sulphate, calcium sulphate, aluminium oxide, china clay, talc, silica, infusorial earth, calcium carbonate, etc.).

"The fixation of the colouring matter on the base is usually obtained by:

"1. Precipitating the colouring matter on the base with precipitating agents (tannin, barium chloride, etc.), or by co-precipitation of the colouring matter and the base.

"2. Dyeing the base with a solution of the colouring matter.

"3. Intimate mechanical mixing of an insoluble colouring matter with the inert base...

"Colour lakes are mostly prepared from those synthetic organic dyestuffs (heading 32.05) with a high resistance to oxidation ... These lakes are used mainly for manufacturing printing inks, wallpaper and oil paints.

"Colour lakes may also be prepared from organic colouring matters of animal or vegetable origin (i.e. those of heading 32.04)...

"These products are often in the form of powders."

Although representations were made to the Board respecting colour lakes, they were general in nature and were mainly concerned with matters of classification and proposed rates, as noted under Tariff Considerations below. In the import data, colour lakes are combined with other products. The data indicate that, at most, imports of colour lakes are between one and two million dollars a year. The U.S.A. appears to be the principal source of supply.

Other Colouring Matter; Inorganic Products of a Kind
Used as Luminophores - B.T.N. 32.07

With certain exceptions, heading 32.07 relates to inorganic colouring matter or colouring matter of mineral origin and inorganic pigments with added organic dyestuffs. The heading also includes the above colouring materials and also earth colours and natural iron oxides when put up in the form of concentrated dispersions in artificial plastics, natural rubber, synthetic rubbers, plasticizers or other media, or in the form of mixtures with relatively large quantities of surface-active agents or organic binders. Inorganic products of a kind used as luminophores are also classified in this heading.

The heading excludes natural micaceous iron oxides, earth colours, separate chemically defined inorganic colouring matter such as basic lead carbonate, oxides of iron, lead, chromium or zinc, sulphides of zinc or mercury, and lead chromate. The natural iron oxides and earth colours are classified in heading 25.09 and are dealt with immediately following heading 32.07. The separate chemically defined products listed above are classified under various headings of Chapter 28; they are discussed under their relevant headings.

The Main Products

The principal inorganic pigments under consideration here include white pigments, such as extended titanium dioxide, basic silicate lead pigment and lithopone; mineral blacks, such as shale black or silica black; and synthetic inorganic pigments other than black and white, the more important of which are chrome and zinc chromate yellows, chrome and molybdate oranges, and chrome greens, Prussian blue and Turnbull's blue, and ultramarine. The products used as inorganic luminophores, or daylight fluorescent agents, possess the same characteristics and are used for essentially the same purposes as the organic luminophores described under heading 32.05 earlier in this section.

Most of the extended titanium dioxide pigments currently in use, in Canada are of the calcium sulphate, or "C", type and contain either 30 or 50 per cent of titanium dioxide mixed or co-precipitated with calcium sulphate. Basic silicate white lead pigment is a mixture of lead silicate and lead oxide, and lithopone is a mixture of barium sulphate and zinc sulphate. The mineral blacks of this heading are produced mostly from bituminous shales, coal or coke, usually by calcination. With the exception of basic silicate white lead, the white and black inorganic pigments that fall within the scope of this heading are not manufactured in Canada.

The remaining inorganic pigments, namely those other than black and white, are based mostly on chromium, cadmium and cobalt and mixtures of such products with other inorganic substances. The inorganic luminophores are based mostly on zinc sulphide and cadmium sulphide; some are activated by salts of elements such as silver, copper or manganese.

The inorganic pigments range in price from less than ten cents a pound for titanium white and lithopone to just under 60 cents a pound for iron blue; they are cheaper and are used in larger quantities than organic pigments. As noted above, the organic pigments range in price from about 90¢ to over \$4.00 per pound.

By far the largest use of synthetic inorganic pigments is in the manufacture of coatings and printing inks. However, they are also used in the manufacture of floor and roof coverings, rubber, plastics, leather, cosmetics, and in the coating and colouring of textiles.

Method of Manufacture

Synthetic inorganic pigments are generally made by precipitating carefully measured solutions of the various inorganic substances. This is done in large tanks, known as strike tanks, or coupling vats. The controlled chemical reactions, which may last several hours, yield a coloured precipitate known as a slurry. The slurry is pumped into a filter press in which most of the soluble constituents are washed out, yielding a coloured mass known as wet press-cake. Most press-cake is processed into dry form by drying it in ovens at temperatures between 125 to 185 degrees Fahrenheit. The dried pigment, in the form of coarse lumps is pulverized in a hammer mill and becomes known as dry pigment, or dry colour. Most of the pigments are sold in this form; some are also sold dispersed in various media. Dispersion of pigments is normally one of the stages in the manufacture of decor-

ative and protective coatings and printing inks, although pigment manufacturers do disperse pigments for those paint and ink manufacturers who do not have their own dispersing facilities. When crushed pigments are dispersed in drying oils, white spirit, turpentine or varnish, they are classified in heading 32.09 which applies to pigment dispersions of a kind used in the manufacture of paints.

The press-cake which is not processed into dry colour is sold as such, in the form of pulp or as a flushed pigment. Pulp is press-cake which has been made into a smooth paste by mechanical treatment. Flushing involves the replacement of the water present in the press-cake by another medium. To accomplish this, the wet press-cake coming from the filter press is transferred to a mixer, known technically as the flushing machine, or flusher, where it is mixed with a heavier medium, such as a natural oil or varnish. Because of greater affinity, the pigment particles contained in the press-cake transfer to the heavier medium rejecting, or flushing out, most of the water which rises and accumulates at the surface. The transfer is aided by agitation and the addition of certain chemicals, such as surface-active agents. Flushed colours, originally developed to provide finely dispersed pigments for use in the manufacture of printing inks, are now also used in the manufacture of coatings, plastics, rubber, and in textile printing. They are classified in heading 32.09.

Synthetic pigments are manufactured in batches which may range from 150 to 1,000 pounds each. Only seldom does the colour of any one batch meet the required standard; the necessary adjustments are made by blending dry pigments from different batches until the standard is matched. This, as well as most of the other manufacturing processes, is carried out under close laboratory control.

Most of the synthetic pigments manufactured in Canada are understood to fall within a group of about 200 standard formulations which account for the bulk of the pigments used in the manufacture of coatings and inks. Year-to-year variations within this group were said to be relatively small; made-to-order shipments are, apparently, rare.

The cost of purchased materials was reported to be, on the average, equivalent to between 50 and 55 per cent of the factory selling price of the pigments manufactured in Canada.⁽¹⁾ According to the available evidence, almost all of the colouring materials used in the manufacture of organic pigments and about one half of those for inorganic pigments are imported.⁽²⁾ Because inorganic pigments usually account for about 80 per cent of the synthetic pigments made in Canada, Canadian manufacturers appear to rely on imports for about 60 per cent of the colouring materials which they use. About one third of the imports are of organic intermediates and dyes which are now entitled to duty-free entry. The remainder consists mostly of inorganic substances, such as sodium dichromate and sodium molybdate; these are also duty-free under the British Preferential Tariff, but

(1) Transcript, Vol. 94, p. 14264

(2) Same, Vol. 93, p. 14216

are dutiable, mostly at 10, 12 $\frac{1}{2}$ or 15 p.c. under the Most-Favoured-Nation Tariff. Among the materials procured mostly domestically are inorganic chemicals such as zinc oxide, iron oxides, mineral acids and alkalis.

Canadian Manufacturers and Market

The following firms are at present engaged in the manufacture of such pigments for sale on a substantial scale: Dominion Colour Corporation Limited, New Toronto, Ontario, Hercules Powder Company (Canada) Limited and McArthur, Irwin, Limited, Montreal, Quebec. The last named firm also manufactures basic silicate white lead pigment. The only activity of Dominion Colour is the manufacture of synthetic pigments; the other two firms are engaged in the manufacture of other products on a substantial scale.

The Canadian manufacturers, between them, make about 35 basic types of synthetic pigments encompassing close to 200 different formulations. About 55 per cent of the value of their total output usually consists of inorganic pigments, including most of those based on chromium compounds. Among the principal organic pigments manufactured in Canada are toluidine and lithol reds and benzidine yellows. The principal types of pigments which Canadian manufacturers do not make at the present time include phthalocyanine, quinacridone (both in heading 32.05) and cadmium pigments and ultramarine blue (both in heading 32.07).

Canadian shipments of synthetic pigments have been increasing steadily in recent years, from some \$3 million in 1962 to about \$4 million in 1964. At the time of the public hearing in 1962, it was estimated that about one-half of the value and approximately 90 per cent of the volume of the synthetic pigments made by the Canadian manufacturers were for use in the manufacture of surface coatings and inks; the remainder was said to be used in the manufacture of rubber, linoleum, plastics, coated fabrics, coated papers and other products.⁽¹⁾

Imports of inorganic pigments have increased very slightly. In 1962, the first year for which statistics are available, they were valued at nearly \$7 million, and in 1964 at \$7.2 million. The details of imports during 1964 by type and principal sources are shown in the following table.

About 89 per cent of the imported pigments usually originate in the United States. Of the imports in 1964, about \$2 million consisted of white pigments, including extended titanium dioxide and lithopone, neither of which is manufactured in Canada at the present time. The remaining imports, valued at about \$5 million, consist mostly of pigments other than black and white. Imports of luminescent agents for paints are also classified in heading 32.07, and in 1964 were valued at \$1.6 million, 18 per cent of the total for the heading. The available data suggest that the inorganic pigments, including luminescent agents were valued at approximately \$13 million in 1964, of which about \$4 million was supplied from domestic production.

⁽¹⁾ Transcript, Vol. 93, p. 14215-6

Imports of Colouring Materials of B.T.N. Heading 32.07, 1964

<u>Type of Pigment</u>	<u>United Kingdom</u>	<u>United States</u>	<u>Other</u>	<u>T o t a l I m p o r t s</u>		
	<u>\$'000</u>	<u>\$'000</u>		<u>\$'000</u>	<u>'000 lb.</u>	<u>\$/lb.</u>
Orange and yellow	95	892	49	1,036	1,056	.98
Blue and green	382	1,448	182	2,012	1,982	1.01
Red and maroon	135	1,857	76	2,068	749	2.76
Extended titanium dioxide	-	2,000	-	2,000	20,887	.10
Lithopone	21	13	47	81	1,078	.08
Luminescent Agents, etc.	<u>1</u>	<u>1,616</u>	<u>-</u>	<u>1,617</u>	<u>491</u>	<u>3.30</u>
TOTAL	634	7,826	354	8,814	26,243	.34

Source: D.B.S., Cat. No. 65-007

In their submission, the Canadian manufacturers of synthetic pigments described their competitive position in the Canadian market as follows:

"Within the range we produce, our quality, price and service are such that the Canadian manufacturers obtain 85-90 per cent of the market for these materials. Canadian prices for organic pigments are consistently lower than prices prevailing in the U.S. Prices for inorganic pigments in Canada generally are close to or below U.S. prices."(1)

Thus, although imported inorganic pigments supply about two-thirds of Canadian requirements those imported pigments considered by the manufacturers to be within the range of pigments produced in Canada account for only 10 or 15 per cent of the Canadian market. For the most part, Canadian manufacturers are competitive in price for the range of products which they manufacture. The existing rate of 17½ p.c., M.F.N., tends to raise the landed cost of imports from the U.S.A., the principal and most likely source of imports, well above the comparable price of like pigments made in Canada. These conclusions are corroborated by the following statement made at the public hearing by the spokesman for Canadian manufacturers of synthetic pigments:

"the United States does export to Canada. In general, it does not export the things that we make, because of the price. It exports other types of pigments..."(2)

"We think that our performance under the handicaps which we necessarily have is a good indication that under a different set of circumstances we could hold up our end with others, and certainly we have nothing to fear from competition from the United States if we had free entry both ways. We would welcome this with a good deal of enthusiasm."(3)

(1) Transcript, Vol. 93, p. 14218

(2) Same, Vol. 94, p. 14272

(3) Same, Vol. 94, p. 14277

As noted earlier, with one exception, the black and white pigments that are under consideration in this chapter are not manufactured in Canada; the only known exception is basic silicate white lead pigment which is made in Canada in small quantities. The extended titanium dioxide pigment, which is by far the most important white pigment, originates only in the United States. Recent trends in the Canadian market for extended and pure titanium dioxide are discussed in some detail under heading 28.25 in another volume of this report.

The principal black pigments used in Canada are carbon black and to a much lesser extent, lamp black. They are discussed in this report under heading 28.03. The artificial blacks that do fall under heading 32.07, such as those derived from bituminous shales or coal, do not appear to be of commercial importance in Canada and no information is available concerning them.

Earth Colours, Whether Or Not Calcined Or Mixed
Together; Natural Micaceous Iron Oxides - B.T.N. 25.09

The Explanatory Notes to the Brussels Nomenclature state:

"The colours classified here are usually naturally occurring clays mixed with white or coloured mineral substances, particularly iron oxide; because of their colouring properties, they are generally used as pigments."

They include ochres, siennas, umbers, black earths and natural vandyke brown, Verona earth and Cyprus earth. The above are classified in heading 25.09 whether or not calcined or mixed together. However, they are classified in Chapter 32 when mixed with other substances or when presented as dispersions in water, oil, etc. Heading 25.09 excludes

"iron ores ... and natural ferrous earth colours containing 70% or more by weight of combined iron evaluated as Fe_2O_3 (heading 28.23)... micaceous iron oxides, mainly used as anti-rust pigments are classified in the present heading 25.09 although they naturally contain more than 70% by weight of combined iron."⁽¹⁾

The products classified in heading 25.09 are closely related to some of those classified in heading 32.07. For example, earth colours brightened with very small quantities of synthetic organic dyestuff are in 32.07; without the addition of the dyestuff, they are in 25.09; soluble vandyke brown and similar products of heading 32.07 are generally obtained by treating earth colours of heading 25.09 with ammonia or potassium hydroxide solutions. The products of heading 25.09, like many of those of heading 32.07, are used in the production of paints, enamels and other similar goods classified in heading 32.09.

(1) Explanatory Notes, p. 112

The more important earth colours and iron oxides currently in use are the ochres, siennas and umbers. They are used mostly as pigments in the manufacture of decorative and protective coatings and in artists' and students' colours. Natural iron oxides, without admixture, are sometimes used as colouring agents, especially in the preparation of anti-corrosive coatings. However, they have been partly replaced in these uses by synthetic iron oxides which are discussed in the volume of the report dealing with heading 28.23. Some earth colours are marketed after simple treatment, such as washing, drying and grinding; others undergo more elaborate treatment, such as calcining.

The Department of Mines and Technical Surveys, in the Canadian Minerals Yearbook 1964, discusses natural iron oxides, as follows.

"Production of natural iron-oxide pigments continued at a low rate in 1964, following the general level established shortly after 1957. Shipments amounted to 914 tons valued at \$79,015 (preliminary) and virtually all went to the pigment and abrasive industries. The natural pigment industry remained in a depressed state because of a limited demand for its products. Prior to 1960, most of the output was used in the purification of producer gas but that market has virtually disappeared. At the same time, synthetic pigments of excellent quality and with a wide range of colours are competing with natural mineral pigments. Statistics on the production of synthetic iron-oxide pigments are not available.

"The production of natural pigment-grade iron oxide indicated ...came from the Red Mill, Quebec, plant of The Sherwin-Williams Company of Canada, Limited. Raw material for this product is recovered nearby from bog deposits formed by the precipitation of iron oxides leached from ferruginous rocks and overburden. The ore is trucked to the company's mill, air-dried, calcined when necessary, pulverized and sized. Much of the output is exported. Small quantities of bog oxide have occasionally been recovered by other interests.

"Many bog iron-oxide deposits occur in Champlain County, Quebec, principally near Three Rivers. They are also found in Laviolette and Yamaska counties, Quebec; Colchester County, Nova Scotia; near New Westminster, British Columbia; and in other areas of British Columbia, Saskatchewan, Manitoba and Ontario.

"In the latter part of 1964, Ferrox Iron Ltd. started to produce natural iron oxide concentrates from a new plant at Prescott, Ontario. The initial plant capacity of 10 tons a day has since been raised to 20 tons a day. This company converts iron ore into high-purity iron oxide mainly for use as a constituent in the production of ferrites and iron powder. Part of the output will probably find use as abrasives and pigments.

"In 1964, Canada's output of natural iron oxide was used mainly for abrasive purposes in the United States, and as a paint pigment and in the production of ferrites and iron powder in Canada.

"As an abrasive, the commodity is used for metal and glass polishing.

"The natural oxide encounters the most competition from the synthetic variety in the pigment industry. Synthetic iron oxides can be produced more uniformly in numerous pigmentary shades and consequently are in greater demand. Both types are used in paints, rubber, linoleum, vinyl and plastic products, ceramics, concrete, mortar, paper, wood and leather stains as well as in other materials. Iron-oxide pigments are available in colours from yellow through brown to black. They are used because of their permanence of colour and ability to inhibit the oxidation of metal surfaces. The pigment should either compare with a standard colour or have a tinting power that will allow it to be conditioned to compare with a standard. The particle size should be less than 325 mesh and the oil absorption should approximate that of a standard. A high degree of opacity and hiding power is required.

"Prices vary considerably, particularly with quality or grade. The average price of the refined natural iron oxide produced in Canada in 1964 was \$86.45 a ton at the plant.

"United States prices for various types of iron oxides were quoted by the December 28, 1964, OIL, PAINT AND DRUG REPORTER as ranging from $6\frac{1}{2}$ to $16\frac{1}{2}$ cents a pound."

It should be noted that natural iron oxide which contains 70 per cent or more by weight of combined iron evaluated as Fe_2O_3 is classified in heading 28.23; if of a lesser content of iron oxide it is in heading 25.09. It is probable that at least some of the natural iron oxide discussed in the Minerals Yearbook would be classified in heading 25.09, but a breakdown on the basis of iron oxide content is not available.

Published statistics show that imports of ochres, ochrey earths, siennas and umbers, in 1961, the last year for which they were reported separately, were valued at about \$65,000 and were mostly from the United States. The consumption of ochres, siennas and umbers by the Canadian paint and varnish industry was valued at about \$45,000, in that year. For 1964 the statistics combine natural and synthetic iron oxides. Exports of these in 1964, were 2,408 tons valued at \$473,633 and imports were 3,071 tons valued at \$535,852. Trade was mainly with the U.S.A. and much of the imports was for use as a pigment, according to the Minerals Yearbook.

Prepared Pigments, Prepared Opacifiers and Prepared Colours,
 Vitrifiable Enamels and Glazes, Liquid Lustres and
 Similar Products, of the Kind Used in the Ceramic,
 Enamelling and Glass Industries; Engobes (Slips);
 Glass Frit and Other Glass, in the Form of Powder,
 Granules or Flakes - B.T.N. 32.08

Heading 32.08 "covers a range of preparations used in the ceramic industry (china, earthenware, etc.), in the glass industry or for colouring or finishing metal articles."⁽¹⁾ The heading includes dry mixtures, pastes, solutions or suspensions of metallic compounds, glass powder or granules and similar preparations. The heading excludes glass frit and other varieties of glass when in forms other than powder, granules or flakes, for example vitrite, enamel glass and ballotini.

Ferro Enamels (Canada) Limited, of Oakville, Ontario, is the only known Canadian manufacturer of the colouring preparations under consideration. This firm, primarily a manufacturer of vitreous enamels and glazes, has been making ceramic colours for use in porcelain enamels and glazes since 1950 and, since 1960, has also been making glass colours.

Imports of products classified in heading 32.08 have been increasing at a fairly rapid rate in recent years, and in 1964 were of the order of \$1.8 million most of which (84 per cent) were from the U.S.A.; almost all of the remaining 16 per cent was from Britain. Although there is no public information regarding Canadian shipments of these products, it is known that they constitute more than one-half of the market supply, suggesting a market in Canada of the order of \$4 million annually.

TARIFF CONSIDERATIONS

The discussion here relates to the five headings of chapter 32, 32.04 to 32.08 inclusive and to heading 25.09. The materials to which each of these headings relate is given below, in abridged form.

- 32.04 Colouring matter of vegetable or animal origin.
- 32.05 Synthetic organic dyes and pigments; synthetic organic luminophores; optical bleaching agents, natural indigo.
- 32.06 Colour lakes.
- 32.07 Inorganic colouring matter; inorganic luminophores.
- 32.08 Prepared pigments, vitrifiable enamels, glass frit and other preparations used in the ceramic and glass industries or for colouring or finishing metal articles.
- 25.09 Earth colours and natural micaceous iron oxides.

The materials classified in 25.09 are of a lesser purity than the earth colours and iron oxides of heading 28.23. When the

(1) Explanatory Notes to the Brussels Nomenclature, p. 318

products of heading 25.09 are mixed with other substances such as organic dyestuffs; or are treated chemically, for example, with ammonia or potassium hydroxide solutions; or are presented as dispersions in water, oil, plastics or other media; they are classified in heading 32.07.

The goods that are classified in headings 32.04 to 32.08 are dutiable principally under 22 tariff items of the Canadian Customs Tariff. Only occasionally do the goods covered by a particular tariff item fall entirely under a single B.T.N. heading; when this does happen, the scope of the B.T.N. heading usually exceeds that of the existing item.

Some "basket" items relate to several of the headings of Chapter 32 (and other B.T.N. Chapters as well). The items of this nature are principally 220a(i), 220a(ii), 246, 247 and 711; the remaining 16 items relate mainly to products of only one of the headings or, sometimes, to two of the headings under consideration here. A list of the 16 existing items involved is given below, in abridged form, showing, in illustrative fashion, which of the B.T.N. headings under consideration apply to each.

Principal Tariff Items Which Apply to B.T.N. Headings 32.04 - 32.08

	<u>Existing Item and Short Description</u>	<u>B.P.</u> p.c.	<u>M.F.N.</u> p.c.	<u>Relevant</u> <u>Heading</u>
*90f	Vegetable materials for use as colourings or flavourings	10	10	32.04
203	Extracts of seeds, bark for dyeing or tanning, indigo, annatto etc.	0	0	32.04, 32.05
203a	Chemical compounds soluble in water, adapted for dyeing or tanning	0	0	32.05
203b	Aniline & coal tar dyes, adapted for dyeing, in bulk or packs over 1 lb.	0	0	32.05
203c	Solns. of aniline dyes, adapted for dyeing, for use in Cdn. mfrs.	0	0	32.05
203d	Pigs. & inks for use in coating, colouring or printing of textiles	0	0	32.05, 32.07
203g	Solns. of dyes containing methyl alcohol for colouring coated surfaces,	per gal. 5¢	5¢	32.05
220d	Chemical preparations, dry, for coating inside of fluorescent lamps	0	5	32.05, 32.07
240	Ultramarine blue, whiting or whitening, gilders whiting	0	10	32.07
242	Lithopone, white pigs. with not less than 14% of titanium dioxide	0	12½	32.07
245	Ochres, ochrey earths, siennas and umbers	5	12½	25.09
246b	Stains & oxides for use as colouring constituents in mfr. of vitreous enamels & glazes	0	20	32.08

<u>Existing Item and Short Description</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>Relevant</u>
		<u>p.c.</u>	<u>p.c.</u>	<u>Heading</u>
246c	Finely divided metal or compounds of dry, suspended or dissolved for use in mfr. of glass, porcelain etc.	0	0	32.08
246d	Colours or pigments for use in the manufacture of roofing granules	0	0	32.05, 32.07
*246e	Daylight fluorescent pigments dry, without admixture for use in Cdn. mfr.	0	0	32.05, 32.07
249	Varnishes, lacquers, japans, driers and oil finish n.o.p. per gal. 15¢ and 5	15¢ 5	15¢ 15	32.08

* Not in Reference 120

Heading 32.06 (colour lakes) is not shown in the above tabulation because colour lakes are classified mostly under general items of the Canadian Customs Tariff, such as 220a(i), which are not listed.

Some of the tariff items tabulated above also relate to B.T.N. headings of Chapter 32 other than those here under consideration. However, insofar as headings 25.09 and 32.04 to 32.08 are concerned, and apart from more general items such as 220a(i) and 711, only five items pertain to more than one heading; these are items 203, 203d, 220d, 246d and 246e. Item 203 relates to heading 32.05 only because it provides for indigo; otherwise it provides only for products classified in heading 32.04. Items 203d, 220d, 246d and 246e provide for both organic and inorganic colouring matter and therefore apply to both heading 32.05 (organic products) and heading 32.07 (inorganic products).

In the table which follows, an attempt has been made to reconcile B.T.N. headings 25.09 and 32.04 to 32.08, inclusive, with the principal, relevant, existing tariff items and the available statistics. Because of problems of reconciliation, the data in the table should be regarded as approximations. It is probable that the value of imports of goods classified in heading 32.07 is overstated and that some of these materials would be classified in heading 32.05; the statistics regarding colour lakes are also not satisfactory.

By these data, imports of goods classified under B.T.N. headings 25.09 and 32.04 to 32.08 were valued at about \$30 million in 1964 of which about \$11 million, or more than one-third, were dutiable. Imports of synthetic organic dyes and other materials of heading 32.05 constituted 56 per cent of the value of imports tabulated; practically all of these were entered free of duty. About 54 per cent of the imports of products of heading 32.04 (vegetable or animal colouring matter) were also entered free of duty. Most imports of goods of headings 25.09, 32.06, 32.07 and 32.08 were dutiable.

In the course of the public hearings the Board received representations concerning the colouring agents under discussion from about twenty separate interests. Nine of these were Canadian manufac-

Approximate Allocation of Imports to B.T.N. Headings and Existing Tariff Items

B.T.N. Heading and Description	Principal Relevant Items			1964 Imports			Dutiable Imports		Duty as % of Dutiable
	Item	B.P.	per cent	B.P.	M.F.N. \$'000	Total	B.P.	M.F.N. \$'000	
25.09 Earth colours; natural iron oxides	245	5		4(a)	61(a)	65(a)	4	61	5.0 12.3
32.04 Colouring matter of vegetable or animal origin	*90f 203	10 0		102	482	584	24	244	13.4 11.0
32.05 Synthetic organic dyes, pigments, luminophores, optical bleach; indigo	203 203a to 203d, inc. 203g 220a(i) *246e	0 0 5¢ (per gal.) 15 0		1,902	14,798	16,700	6	177	14.5 17.0
32.06 Colour lakes	220a(i) 246	15 12½		62	1,834	1,896	61	1,520	11.6 18.6
32.07 Inorganic colouring matter, inorganic luminophores	203d 220a(i) 240 242 246 246d *246e	0 15 0 0 12½ 0 0		688	8,126	8,814	481	7,049	12.7 13.6
32.08 Pigments, vitrifiable enamels, glass frit, etc., for ceramic & glass industries	246 246b 246c	12½ 0 0		291	1,492	1,783	87	1,065	11.4 19.2
Total of above				3,049	26,793	29,842	663	10,116	12.4 14.9

* Not in Reference 120
(a) 1961 data

turers, seven were users and the remaining four were importers or distributors. The representations are discussed below grouped generally according to the relevant B.T.N. heading. In a few instances, where the representations applied to more than one heading, they are discussed after the last heading to which the representations apply.

The Industry Committee proposed the adoption of B.T.N. headings 25.09, 32.04, 32.05, 32.06, 32.07 and 32.08 for the purpose of classifying the products under consideration. The Committee also proposed rates of 15 p.c., B.P. and 20 p.c., M.F.N. for those products covered by these headings for which the Board received no other representations.

As noted earlier, B.T.N. heading 32.04 encompasses colouring matter of vegetable or animal origin. Vegetable colouring matter adapted for dyeing materials other than food is entered under item 203, free of duty under all Tariffs; vegetable food colouring is entered under item 90f, at rates of 10 p.c., B.P. and 10 p.c., M.F.N.; the item is not in Reference 120. Colouring matter of animal origin probably is entered mainly under item 711. Item 203 also provides for plant materials classified in heading 13.01 of the B.T.N. and for other goods not classified in Chapter 32, for example aniline (29.22) and red liquor (38.12).

At the public hearing, the Dye and Chemical Company of Canada Limited (Dyeco) of Kingston, Ontario, made representations concerning annatto colouring, a vegetable extract. The firm prepares an extract from imported seeds and markets it in liquid or powder form, in bulk, in individual packages and as wafers, mostly for use in colouring dairy products and margarine.

Dyeco requested the deletion of the words "annatto, liquid or solid" from tariff item 203 and the adoption of the B.T.N. for classification of the product, with rates of 15 p.c., B.P. and 20 p.c., M.F.N. The company reported that while liquid annatto colouring was at present allowed duty-free entry under item 203, intermediate products described as annatto concentrate and powdered annatto colouring, prepared from liquid annatto, were dutiable at 10 p.c. under tariff item 90f. Item 90f provides for vegetable materials for use as colourings or flavourings and, as already noted, is not before the Board in Reference 120.

In support of its request, Dyeco stated:

"The words 'annatto, liquid or solid' have been in the customs tariff since the 1800's and in item 203 since 1906. Apparently the item was designed to cover dyestuffs and dyeing and tanning materials, not made in Canada at that time, used in the textiles and tanning industries, and included annatto which today is an important food colouring product made in Canada...

"It is pointed out to the Board that there is an anomaly or inconsistency in the present tariff in as much as semi-processed goods of the type annatto or bixin concentrate, ... is dutiable under item 90f at 10 per cent, whereas goods processed beyond this point such as liquid oil soluble annatto and aqueous alkali soluble annatto enter under item 203 duty free.

"Further that oil soluble annatto powder which is an additional processing step beyond liquid oil soluble annatto is dutiable under item 90f.

"During the many hearings on chemicals, the Board has been informed in general and specific commodity briefs of the difficulties of the industry respecting scale of operations and wages; cost of research, development and transportation; short runs; size of and competition in the Canadian market from low priced imports, etc., etc. Dyeco encounters the same difficulties ..."(1)

Information concerning Canadian shipments and imports of annatto colouring is not available from public sources. Dyeco estimated that, in 1960, it and another Canadian producer supplied somewhat less than one-half of the Canadian market for this product, the balance being supplied by imports from at least three manufacturers in the United States. The spokesman for the company indicated that competing products imported from the United States had been selling in Canada as much as 30 per cent below the U.S. list price. However, he was unable to give representative prices at which the imported products were being sold in Canada as these, apparently, vary widely from one customer to another.(2)

From information obtained by the Board it appears that the cost of materials is equivalent, on the average, to just under 50 per cent of the selling price of annatto colourings manufactured in Canada. Thus, the value added by the manufacturing process is a somewhat higher percentage than for some of the other colouring agents under consideration in this volume.

The Board received communications from the Cheese Producers Board of Ontario and the Ontario Cheese Producers protesting the proposal of Dyeco for a duty on annatto because it would tend to increase the cost of manufacturing butter and cheese.

The Primary Textile Institute and the Tanners Association of Canada opposed all changes respecting goods entered under tariff item 203, which would result in any increases in duty. These submissions are dealt with below.

After noting that all products of economic importance which would fall in heading 32.04 had been dealt with in the producer's submission, the Industry Committee recommended rates of 15 p.c., B.P. and 20 p.c., M.F.N., for all the other products classifiable under the heading. Because the scope of heading 32.04 exceeds that of item 203 as it relates to colouring matter of vegetable or animal origin, the Committee's proposal, if adopted, would result in a very substantial increase in duties, from free entry to 15 or 20 p.c., for the products affected. The spokesman for the Committee did not indicate why the higher rates were necessary nor why they were specifically appropriate for the products to which they were intended to apply. These rates were proposed generally by the Committee as a residual provision.

(1) Transcript, Vol. 96, p. 14585- 7

(2) Same, Vol. 96, p. 14588

With the exception of the annatto colouring made by Dyeco and, possibly, by another firm which did not appear before the Board, the colouring materials of vegetable or animal origin, classified in heading 32.04, do not appear to be manufactured in Canada at the present time. Imports of vegetable colouring agents for which statistics are available, were valued at about \$584,000 in 1964, of which more than two-thirds were food colours entered under item 90f at rates of 10 p.c., B.P. and 10 p.c., M.F.N. No information is available respecting imports of colouring matter of animal origin.

B.T.N. heading 32.05 provides for synthetic organic dyestuffs (including pigment dyestuffs), synthetic organic luminophores, optical bleaching agents, substantive to the fibre and natural indigo.

The goods classified in heading 32.05 are now entered mainly under existing tariff item 203b, "aniline and coal tar dyes, adapted for dyeing" and 203c, "solutions of aniline dyes ... adapted for dyeing". To a lesser extent, items 203, 203a, 203d, 203g, 220a(i), 220a(ii), 220d, 246, 246d, 246e and 921 also apply to products of heading 32.05, some of them to a very minor extent.

The synthetic organic dyes, practically all of which are imported, are for the most part classified under different tariff items than the pigments, some of which are manufactured in Canada. The desirability of such a separation was stressed by the Industry Committee in its submission on heading 32.05. A similar view was also expressed by a spokesman for Canadian manufacturers of synthetic pigments. The use of the Brussels Nomenclature for tariff classification provides no obstacle to this.

Natural indigo is classified, in the Customs Tariff, under item 203 as colouring matter of vegetable origin and, as such might be expected to be classified under heading 32.04 of the B.T.N. Its classification under heading 32.05, which relates to synthetic products, was explained by the fact that natural indigo is difficult to distinguish from synthetic indigo. The synthetic product has, apparently, almost completely displaced the natural material.⁽¹⁾ Published data show that imports of indigo, indigo paste and indigo extract entered under tariff item 203, declined rapidly, from just under \$150,000 a year in the mid-1950's to about \$3,000 in 1961; since 1962, imports have not been separately reported. Natural indigo in its various forms has been duty-free since at least the beginning of the century; there is no evidence of domestic production.

Luminophores are classified under heading 32.05 if they are organic products and under heading 32.07 if they are inorganic. Under the existing Tariff, they are entered under items 220d, 246e and 921 either free of duty or at low rates, if they are intended for the end-uses specified in these items. They are otherwise dutiable at 12½ p.c., B.P., 17½ p.c., M.F.N., under item 246.

In 1964 known imports of luminophores, including both organic and inorganic types, were valued at \$1.6 million, almost all originating in the U.S.A. Ninety per cent of the total was dutiable at 5 p.c.

⁽¹⁾ Transcript, Vol. 97, p. 14611

under item 220d which applies to imports for use in coating the inside of fluorescent lamps or electronic tubes; the remainder of the imports apparently was entered under item 246e, free of duty under the B.P. and M.F.N. Tariffs. There is no known Canadian production of this group of products.

Canada Packers, Limited, Colgate-Palmolive Limited, Lever Brothers Limited and The Procter & Gamble Company of Canada, Limited, all of Toronto, urged that the materials known as optical bleaches, optical brighteners or fabric brighteners, be allowed duty-free entry from all countries until they are made in Canada. At present, they are imported free of duty under tariff items 203b and 203c.

In support of their request for continued duty-free entry the four companies said that these products do not compete with materials of Canadian manufacture and that their production in Canada was unlikely in the foreseeable future owing to the complexity of manufacture and the small size of the Canadian market.⁽¹⁾

Imports of organic optical brighteners were valued at about \$1.3 million in 1964; the U.S.A., Western Germany and Switzerland were the principal suppliers. The four companies estimated that about 60 per cent of the value of Canadian consumption was used by the detergent industry, principally by themselves; the remainder was said to be divided about equally between the paper and textile industries.⁽²⁾ When used in the manufacture of soaps and detergents, the optical bleaching agents were reported to account for three to seven per cent of the raw material costs.⁽³⁾

Standard Ultramarine & Color Company Limited, of Toronto, urged continued duty-free entry of monosulphonic acid and penta methyl pararosaniline pulps. At the time of the public hearing, the monosulphonic acid pulp was reported to be imported duty-free under tariff item 203f, while the penta methyl pararosaniline pulp was being entered under item 203b, also duty-free. The Board has been advised that both products have since been reclassified, the former under item 203b, free of duty and the latter under item 711, at 15 p.c., B.P. and 20 p.c., M.F.N. Under the Brussels Nomenclature, both are classified as synthetic organic dyestuffs of heading 32.05.

Standard Ultramarine imports the two types of pulp, or presscake, from its parent company in the United States for use in the manufacture of methyl violet and alkali blue toners. This involves the replacement of the water contained in the pulp by a heavier medium, such as an ink varnish in a process called "flushing", described earlier. The flushed colours produced by the company are used mostly in the manufacture of printing inks. Flushed colours are discussed in the section dealing with the products classified in heading 32.09. According to the evidence given at the public hearing, the flushing operation performed by the company enhances the value of the imported pulp by more than 50 per cent.⁽⁴⁾

(1) Transcript, Vol. 97, p. 14674

(2) Same, Vol. 97, p. 14671

(3) Same, Vol. 97, p. 14673-4

(4) Same, Vol. 97, p. 14717

In support of its request for duty-free entry, Standard Ultramarine stated that the two types of pulp were not made in Canada and were not likely to be made because the volume required for economic production does not warrant their manufacture in this country.

A spokesman for the Canadian Color Makers Association testified at the public hearing that penta methyl pararosaniline pulp was manufactured in Canada. This type of pulp, however, now accounts for only a very small portion of Standard Ultramarine & Color Company's imports and is at present dutiable at 15 p.c., B.P. and 20 p.c., M.F.N. under tariff item 711.

The Canadian Paint Varnish and Lacquer Association urged that phthalocyanine and quinacridone pigments and vat colours of heading 32.05 be entered at rates of Free, B.P., 5 p.c., M.F.N.

These products, if dry, are now dutiable at 12½ p.c., B.P., 17½ p.c., M.F.N., under tariff item 246; some are probably also imported duty-free under item 203b. In support of its request, the Association said:

"None of these types of pigments are made in Canada today. Furthermore, due to lack of the market required for the economic manufacture of these dry colours, it is our understanding that they will not be available from Canadian sources in the foreseeable future."(1)

A spokesman for the Canadian Color Makers Association confirmed that the three types of materials under discussion were not among those made in Canada and said that, for this reason, the Association had no objection to duty-free entry of these particular products for use in the manufacture of paints.

From published information and from a survey conducted by the CPVLA, it appears that in 1961 phthalocyanine and quinacridone pigments used by Canadian manufacturers of surface coatings were valued at \$494,000 and \$328,000, respectively.(2) In 1962, imports of vat dye-stuffs were shown separately in the trade statistics for the first time. In that year imports were valued at \$1.4 million; in 1964 the value of imports of vat dyestuffs was essentially unchanged. No further data are available regarding quinacridone pigments but Canadian use of phthalocyanine colours appears to be increasing. In 1963, Canadian use in surface coatings was valued at \$681,000, an increase of 38 per cent over that reported for 1961.

Other representations to the Board with respect to products classified in heading 32.05 were more general and also dealt with other headings of Chapter 32; these are discussed later in this section.

The colour lakes provided for in B.T.N. heading 32.06 are prepared mostly from the synthetic organic dyes classified in heading 32.05 or the colouring matter of animal or vegetable origin of heading 32.04. Colour lakes are insoluble in water and are obtained by the

(1) Transcript, Vol. 97, p. 14657

(2) Same, Vol. 97, p. 14655

fixation of natural or synthetic organic dyestuffs on a base which is generally mineral such as, barium sulphate, calcium sulphate, calcium carbonate, etc. Colour lakes are entered as dry colours under tariff item 246 or, if in other than a dry state, under item 220a(i). Some may also be entered under tariff items 220a(ii), 711 and 921.

The representations which were made to the Board regarding colour lakes were all part of more general submissions which also dealt with other headings of Chapter 32; they are discussed later in this section.

Colour lakes are not listed separately in the trade statistics. However, the available information suggests that a substantial part of the imports included under the title "pigments, colour lakes and toners, n.e.s." (s.c. 427-99) would be of products classified under heading 32.06. In 1964, imports of that class were valued at \$1.9 million of which 97 per cent originated in M.F.N. countries and 94 per cent from the U.S.A. alone.

B.T.N. heading 32.07 provides for inorganic colouring matter or colouring matter of mineral origin other than: earth colours and natural micaceous iron oxides, separate chemically defined inorganic products, and metallic flakes or powders. The heading includes products such as mineral blacks, lithopone, titanium whites, Prussian blue, ultramarine, zinc grey and others. It also includes inorganic products of a kind used as luminophores.

The tariff items which apply to products classified in heading 32.07 are 203d, 220a(i), 220d, 240, 242, 243, 246, 246d and 246e. The rates which apply to these items are given below.

<u>Item and Brief Description</u>	<u>B.P.</u>	<u>M.F.N.</u>
203d Pigments & inks for textiles	Free	Free
220a(i) Chem. preps. of more than one substance	15 p.c.	20 p.c.
240 Ultramarine blue, whitening	Free	10 p.c.
242 Lithopone, extended titanium dioxide	Free	12 $\frac{1}{2}$ p.c.
243 Dry white lead	15 p.c.	20 p.c.
246 Oxides, colours dry, n.o.p.	12 $\frac{1}{2}$ p.c.	17 $\frac{1}{2}$ p.c.
246d Colours for roofing granules	Free	Free
246e Fluorescent pigments, dry	Free	Free

Canadian Titanium Pigments Limited and British Titan Products (Canada) Limited, both of Montreal, proposed that extended titanium dioxide pigments be dutiable at rates of 15 p.c., B.P. and 20 p.c., M.F.N.; these rates were also proposed by the two companies for pure titanium dioxide classified under heading 28.25. At present, both pure and extended titanium dioxide are entered under tariff item 242, duty-free under the British Preferential Tariff and at 12 $\frac{1}{2}$ p.c. under the Most-Favoured-Nation Tariff. In support of their proposal, the companies stated:

"the value of a titanium dioxide pigment to a user depends on its titanium dioxide content, and the 'extended' titanium pigments are directly competitive with the 'pure' oxide...(1)

"It is perhaps significant that under the present Canadian tariff classification they enter under the same tariff Item 242 and, of course, bear the same rate of duty...

"If Brussels nomenclature is adopted however, the 'pure' titanium dioxide pigments and extended titanium pigments would be classified separately under Headings 28.25 and 32.07 respectively. In this case, it is our contention that identical rates of duty should continue to be applied to both classes of pigments for the following reasons:

- "1. Application of different rates of duty could result in considerable difficulties in administration of the tariff.
- "2. Application of a lower rate of duty to pigments classified under Heading 32.07 would constitute preferential treatment for the 'pure' titanium dioxide content of the titanium pigments classifiable under Heading 32.07. In the case of extended titanium pigments already on the market this would result in their being placed in a more favourable competitive position relative to the 'pure' titanium dioxide pigments by higher rates of duty applicable under Heading 28.25. Additionally, however, it could result in direct circumvention of this protection in that it would be open to a foreign manufacturer or merchant to admix with his 'pure' titanium dioxide pigment a small amount of an extender, without seriously affecting its utility as a 'pure' TiO_2 pigment in many applications, so as to obtain classification under Heading 32.07 rather than Heading 28.25 and so avoid the higher rates of duty applicable under the latter heading."(2)

Canadian Titanium Pigments and British Titan Products manufacture only the pure titanium dioxide in Canada. All extended titanium dioxide pigments are imported from the U.S.A.; in 1964 imports were valued at \$2 million. Most, if not all, of the extended titanium dioxide pigment used in Canada is understood to be supplied by the parent company of Canadian Titanium Pigments. The operations of the two Canadian producers and the Canadian market for pure and extended titanium dioxide are described in this report under heading 28.25.

Canadian Titanium Pigments also made representations concerning basic silicate white lead, requesting that it be dutiable at rates of 15 p.c., B.P. and 20 p.c., M.F.N., the rates at which it was reported to be entered under existing tariff item 243. The company had been importing the pigment from its affiliate in the United States, but at the time of the public hearing was installing equipment to manufacture it in Canada; the Board understands that the company commenced production in early 1963.

(1) Transcript, Vol. 98, p. 14807-8

(2) Same, Vol. 98, p. 14812-3

Basic silicate white lead was reported to be used solely in the manufacture of paints as a cost-saving substitute for white lead. Its consumption by the paint and varnish industry has, in recent years, averaged about 850,000 pounds valued at some \$170,000 annually. Some of this has been supplied by McArthur, Irwin, Limited, of Montreal, which has been manufacturing a type of basic silicate white lead in small quantities since 1954. This company made a submission to the Board concerning this product, but subsequently withdrew it and supported the representations of the Canadian Color Makers Association which included a general request for rates of 15 p.c., B.P. and 20 p.c., M.F.N. for the products covered by heading 32.07.

Canadian Titanium Pigments stated that Canadian users would benefit from a lower price once production was available from its Canadian facilities. It is currently selling the basic silicate white lead which it manufactures at \$19.50 per 100 pounds, compared with a delivered price of \$22.50 per 100 pounds for substantially the same product imported from the United States. McArthur, Irwin had reported that its Canadian-made product was 15 per cent lower in price than the imported pigment.

Union Carbide Canada Limited, of Toronto, made representations concerning concentrated dispersions of carbon black in polyethylene which, under the Brussels Nomenclature, are classified under heading 32.07. The company proposed that this product, also known as black polyethylene masterbatch, be dutiable at rates of 15 p.c., B.P. and 20 p.c., M.F.N., the same as those at which it is now entered under tariff item 220a(i).

The dispersions normally contain between 25 and 35 per cent of carbon black in polyethylene. They are used as colourants in the manufacture of black polyethylene compounds, such as those used in the manufacture of pipe, wire coatings and similar products. Union Carbide and Dunlop Canada Limited are the only known Canadian producers of the dispersions.

In support of its request for continuation of the present rates, Union Carbide stated:

"The existence of a reliable source of supply of black polyethylene masterbatch is essential to the manufacture of black polyethylene compounds. The market for this masterbatch in Canada is limited almost entirely to the four primary producers of polyethylene. The two producers of masterbatch for this market have adequate capacity to supply the demand.

"While it is our belief that the present tariff rates of 15% B.P. and 20% M.F.N. have been effective in discouraging imports, we can find no evidence to suggest that these rates have constituted a burden on the consumer or the economy."(1)

Union Carbide uses some of its own output. Union Carbide, Canadian Industries Limited, Du Pont of Canada Limited and Dow Chemical of Canada, Limited were said to be the four users referred to in the above quotation.

(1) Transcript, Vol. 99, p. 14926

A spokesman for Union Carbide testified that there was no competitive substitute for black polyethylene masterbatch, and that while the magnitude of imports could not be determined, they were believed to be very small, mostly from the U.S.A. and, possibly, Britain. He also said that - apart from the present duty and rate of exchange - prices in Canada and in the United States were comparable.⁽¹⁾

The Canadian Paint Varnish and Lacquer Association Incorporated (CPVLA) made representations concerning lithopone, extended titanium dioxide, ultramarine blue and cadmium pigments classified under heading 32.07. The Association spoke on behalf of Canadian manufacturers of decorative and protective coatings who provide by far the most important market for the pigments under discussion.

For the four types of pigments classifiable under heading 32.07, respecting which it made representations, the CPVLA proposed the following:

<u>Type of Pigment</u>	<u>Existing Item & Rates</u>			<u>Proposed Rates</u>	
	<u>Item</u>	<u>B.P.</u>	<u>M.F.N.</u>	<u>B.P.</u>	<u>M.F.N.</u>
Lithopone	242	Free	12 $\frac{1}{2}$ p.c.	Free	12 $\frac{1}{2}$ p.c.
Titanium-calcium	242	Free	12 $\frac{1}{2}$ p.c.	12 $\frac{1}{2}$ p.c.	12 $\frac{1}{2}$ p.c.
Ultramarine blue	240	Free	10 p.c.	Free	10 p.c.
Cadmium	246	12 $\frac{1}{2}$ p.c.	17 $\frac{1}{2}$ p.c.	Free	5 p.c.

The proposal would result in no change in the treatment accorded to lithopone and to ultramarine blue; the imposition of a duty under the British Preferential Tariff on extended titanium-calcium pigments apparently would have no practical effect because this type of pigment has not been available from B.P. sources. For cadmium pigments, the proposal is for a reduction of 12 $\frac{1}{2}$ percentage points for imports entered under tariff item 246.

In support of its proposals regarding these four types of pigments, the CPVLA noted that none of them was made in Canada, nor was it expected that any of them would be made in Canada in the foreseeable future.

In 1963, the latest year for which information is available, the cadmium pigments used by manufacturers of paints and varnishes were valued at \$228,000, at plant, suggesting that the proposal, if implemented, would result in a saving of about \$28,500 in duties. Cadmium pigments account for less than one per cent of the total value of all pigments used by the industry.

Reckitt & Colman (Canada) Limited, of Lachine, Quebec, made representations on behalf of Reckitt's (Colours) Ltd., of Hull, England, concerning the ultramarine blue now provided for in tariff item 240 and the colours or pigments for use in the manufacture of roofing granules at present entered under temporary item 246d. The company urged that the present treatment of these products be maintained. The submission

⁽¹⁾ Transcript, Vol. 99, p. 14930

noted that ultramarine blue was not manufactured in Canada and that the market was supplied mainly from the United Kingdom and, to a lesser extent, the U.S.A. The English company has accounted for a substantial portion of the imports from the United Kingdom in recent years.

Hardman & Holden Limited, of Manchester, England, made representations concerning ferrocyanide blues classified under B.T.N. heading 32.07, urging that the existing rate of $12\frac{1}{2}$ p.c. now applicable to these pigments under item 246 not be increased. The company noted that, apart from duty, Canadian manufacturers possessed certain advantages in respect of freight and storage charges.

B.T.N. Heading 25.09 applies to earth colours and natural micaceous iron oxides, now entered mostly under tariff item 245 at 5 p.c., B.P. and $12\frac{1}{2}$ p.c., M.F.N. and under item 246 at $12\frac{1}{2}$ p.c., B.P. and $17\frac{1}{2}$ p.c., M.F.N. The products classified in heading 25.09 contain less than 70 per cent by weight of combined iron evaluated as Fe_2O_3 ; when they contain more, they are classified in heading 28.23. To qualify for entry under item 245 the earth colours must contain at least 10 per cent of clay-like material insoluble in hydrochloric acid; for entry under item 246 the clay content must be less than 10 per cent. Under neither item is there a specification regarding iron content and it is probable that products containing more than 70 per cent of combined iron are entered under both items. The iron oxides which contain more than 70 per cent of combined iron are discussed under heading 28.23.

Northern Pigment Company Limited, of Etobicoke, Ontario, made representations concerning the ochres, ochrey earths, siennas and umbers now entered under tariff item 245 and classified mainly under B.T.N. heading 25.09. The company proposed that the existing rates of 5 p.c., B.P. and $12\frac{1}{2}$ p.c., M.F.N., now applicable to these earth colours under item 245 be continued on the grounds that in some cases products imported under item 245 can be used interchangeably with, or as substitutes for, synthetic iron oxides covered by item 246 which are produced by the company.⁽¹⁾ The company endorsed the use of the B.T.N. for classification of the goods.

At the time of the hearing, Northern Pigment was the only Canadian manufacturer of synthetic iron oxides; they accounted for all of the company's output. The company's representations concerning synthetic iron oxides are dealt with in this report under heading 28.23. Northern Pigment did not elaborate on the extent to which the earth colours classified under heading 25.09 do, in fact, compete with the higher grade of iron oxides of heading 28.23. However, it uses processes which enable it to produce very high-grade products which it exports to many countries. As noted in the discussion under heading 28.23, Northern Pigment appears to have a technological lead in this field and can undersell similar products produced in such countries as the U.S.A. and Germany. The products which the company produces are of high purity and would not ordinarily be used in applications for which the earth colours of heading 25.09 were suited.

(1) Transcript, Vol. 98, p. 14779

Minnesota Minerals Limited, of Havelock, Ontario, urged the continuation of existing temporary tariff item 246d, which provides duty-free entry under the B.P. and M.F.N. Tariffs for colours or pigments used in the manufacture of roofing granules. In support of this request, the company, which was believed to be the only manufacturer of roofing granules in Canada, stated:

"In spite of our success with Canadian made pigments there will always be a few pigments, which, for reasons of quality, or lack of a Canadian manufacturer, we shall continue to import. Because pigments constitute an important element of our manufacturing cost, we urge the continuation of item 246d."(1)

The company noted also that it was not seeking any change in item 309a under which roofing granules can be imported duty-free under the B.P. and M.F.N. Tariffs; item 309a is not under review in Reference 120. The company's representations related mainly to products classified in headings 25.09, 28.23 and 32.07.

At the public hearing, a spokesman for Minnesota Minerals testified that the company obtained 45 per cent of its requirements of pigments in Canada and that, of the 55 per cent that were being imported, only 27 per cent consisted of types that could be considered to be of a class or kind made in Canada; these were imported only because particular colors were not available from Canadian production. The company's representations also applied to materials such as iron oxides. The representations of Minnesota Minerals regarding iron oxides are discussed in the part of the report dealing with heading 28.23.

Although earth colours are generally not manufactured in Canada, some natural iron oxides are produced in Quebec and Ontario. Imports of ochres, ochrey earths, siennas and umbers were valued at about \$65,000 in 1961, the last year for which they were reported separately; not all of these would be classified in heading 25.09.

A.S. Paterson Company Limited, of Toronto, expressed opposition to any increase in the rates of $12\frac{1}{2}$ p.c., B.P. and $17\frac{1}{2}$ p.c., M.F.N. now applicable to the dry colours entered under tariff item 246. The company is engaged in the importation of dry colours for distribution in Canada.

Canadian Bronze Powder Works Limited, of Valleyfield, P.Q., requested that bronze powders be excluded from entry under B.T.N. heading 32.07. Such powders are at present specifically provided for in tariff item 361, which is not under review in Reference 120. Under the Brussels Nomenclature bronze powders appear to be classified under heading 74.06.

On behalf of four of its members who are engaged in the manufacture of synthetic pigments other than black and white, the Canadian Color Makers Association (CCMA) made representations respecting the pigments classified under B.T.N. headings 32.05, 32.06 and 32.07, and the materials used in the manufacture of synthetic pigments other than

(1) Transcript, Vol. 98, p. 14873

black and white. The four companies associated in the submission were: Dominion Colour Corporation Limited, The Imperial Flo-Glaze Paints Limited,⁽¹⁾ Imperial Paper and Color Department of Hercules Powder Company (Canada) Limited and McArthur, Irwin, Limited. Together, the four firms account for all of the synthetic pigments, other than black and white, manufactured in Canada.

The CCMA proposed that the pigments classified under B.T.N. headings 32.05, 32.06 and 32.07 be dutiable at rates of 15 p.c., B.P. and 20 p.c., M.F.N.; the Association also made a similar proposal with respect to the dispersed and flushed pigments of heading 32.09, discussed later in this part of the report. The proposed rates were said to be predicated on the acceptance of the Association's proposal for duty-free entry of materials not made in Canada.

The pigments that would be affected by the CCMA's proposal are at present entered mostly under tariff item 246 at 12½ p.c., B.P. and 17½ p.c., M.F.N. The proposal would increase the duties on these, under the B.P. and M.F.N. Tariffs, by 2½ percentage points. The proposal would also affect pigments now entered under such end-use items as 203d, 246d, 246e and 921. The existing duty-free entry for these under the B.P. and M.F.N. Tariffs would be replaced by the proposed rates of 15 p.c., B.P. and 20 p.c., M.F.N. However, the CCMA stated that it would not necessarily oppose requests for lower rates for coloured pigments which were not made in Canada.⁽²⁾ The Association proposed that the following criteria be used to establish whether a particular pigment be deemed to be made in Canada.

- "1. A synthetic coloured pigment is 'made in Canada' or is of a 'class or kind' made in Canada if it is of the same chemical type and made from the same essential chemical components.
- "2. The full rate of duty will apply on all synthetic coloured pigments which are 'made in Canada' etc. whether imported as dry pigment, presscake or as dispersions in water or any other media.
- "3. Mixtures of synthetic coloured pigments will be dutiable at the full rate unless composed entirely of synthetic coloured pigments which are not 'made in Canada' etc."⁽³⁾

As noted earlier, Canadian manufacturers of the synthetic pigments under discussion now supply most of the market for the types of pigments which they manufacture. Imports were valued at about \$7 million in 1964, of which close to \$6 million originated in the United States. Most of the imports are entered under item 246 at 12½ p.c., B.P. and 17½ p.c., M.F.N. and, according to the evidence, consisted mostly of types not manufactured in Canada. Practically all of the pigments entered duty-free under the various end-use items are also not produced in Canada.

(1) This company was acquired by Du Pont of Canada Limited in 1964

(2) Transcript, Vol. 93, p. 14218

(3) Same, Vol. 168, p. 27739-40

The existing tariff does not differentiate between pigments that are organic, inorganic, or are in the form of colour lakes, and available statistics do not permit an accurate breakdown of the imports by B.T.N. headings. However, a large part of the imports appear to be of products classified in heading 32.07; part also consists of materials of heading 32.06. It is estimated that in 1964 imports of products of 32.07 were valued at about \$9 million and those of heading 32.06 possibly at about \$1.5 million.

The application of the criteria proposed by the CCMA for determining the made-in-Canada status of synthetic pigments would depend to a large extent on the interpretation of the phrase "of the same chemical type and made from the same essential chemical components". A spokesman for the Association explained the intended meaning of this phrase as follows:

"When you refer to a chemical type of pigment it means, as I understand it, a pigment of a particular chemical formula essentially. You have a pigment, say toluidine red. Toluidine red is a pigment essentially made by the reaction of certain chemicals together. These can be modified in various ways, but the type is always toluidine red."(1)

Thus, under this interpretation the made-in-Canada status would be determined on the basis of the broad, basic categories into which synthetic pigments are usually classified; once a type of pigment within a broad category, such as toluidine red or chrome yellow, was ruled to be made in Canada, all other types falling within the same category would be so ruled. Most of the basic categories of synthetic pigments include a variety of types, reflecting not only different shades of the same colour, but also differences dictated by the intended use and method of application. In some uses, as in textile applications, these other characteristics are of great importance. Moreover, under the CCMA's criteria, once a pigment was ruled to be made in Canada, it would be held to be made in Canada in all of its forms. For example, phthalocyanine pigments, which are not now made in Canada, might be deemed to be made in Canada because their dispersions are prepared in Canada from imported phthalocyanine pigments. It is evident that the criteria could be interpreted very broadly in subjecting goods to rates of duty based on their being deemed to be made in Canada.

With respect to materials used in the manufacture of synthetic pigments, the CCMA proposed the establishment of the following tariff item, with duty-free entry under the B.P. and M.F.N. Tariffs:

"Materials of a kind not made in Canada for use in the manufacture of synthetic pigments other than black and white pigments."

The Association said that it was not seeking duty-free entry for those materials which are made in Canada. The Association indicated that rates of 15 p.c., B.P. and 20 p.c., M.F.N. should provide adequate protection for such materials when they are made in Canada.(2)

(1) Transcript, Vol. 168, p. 27749

(2) Same, Vol. 93, p. 14210

Elaborating on the proposed wording of the item for materials not made in Canada, the CCMA stated:

"The proposed wording should not be taken to indicate complete satisfaction with the words 'of a kind not made in Canada' as being the best form of words to express our intention. However, that is a problem which cannot be resolved in relation to this proposal alone. We would hope that the form of words which the Board may recommend for other similar items may be suitable in this item also".⁽¹⁾

After noting that the proposed item was intended largely as a replacement for a number of existing items, the more important of which were said to be items 203b, 203c and 203f, the CCMA went on to say:

"The synthetic pigments industry in Canada came into existence only because materials used in the manufacture of pigments could be imported either free of duty or at low rates of duty. The continued health and strength of this industry requires continued free entry at least of those materials not available from Canadian production."⁽²⁾

In the description of the manufacture of synthetic pigments earlier in this section, it was noted that materials account, on the average, for between 50 and 55 per cent of the selling price of the pigments manufactured in Canada; it was reported that about 60 per cent of these materials must be imported and that about 40 per cent of those which must be imported are duty-free under both the B.P. and M.F.N. Tariffs; the remainder is duty-free under the British Preferential Tariff, but dutiable at 10, 12½ or 15 p.c. under the Most-Favoured-Nation Tariff. It is evident that, because materials account for about 50 per cent of the factory cost of the synthetic pigments manufactured in Canada, the effective level of protection on the manufacturing operation accorded by the existing duties under item 246 is in excess of 30 p.c., B.P. and 40 p.c., M.F.N.

The Primary Textiles Institute (P.T.I.), since re-named Canadian Textiles Institute, stated its proposals in terms of extracts from the B.T.N. headings pertaining to the colouring agents of interest to the textile industry. The P.T.I. also made similar proposals with respect to the inks classified under B.T.N. heading 32.13; this latter proposal is considered in the section on inks, later in this part of the report. The proposals of the P.T.I. are given below.

(1) Transcript, Vol. 93, p. 14206

(2) Same, Vol. 93, p. 14209

<u>"Extract from Heading</u>		Proposed Rates	
		<u>B.P.</u>	<u>M.F.N.</u>
32.04	Colouring matter of vegetable origin (including dyewood extract and other vegetable dyeing extracts, but excluding indigo) or of animal origin, when for colouring textiles.	Free	Free
32.05	Synthetic organic pigments, adapted for colouring textiles, when of a kind* not made in Canada.	Free	Free
32.05	Synthetic organic dyes; products of the kind known as optical bleaching agents substantive to the fibre; natural indigo.	Free	Free
32.07	Other colouring matter; inorganic products of a kind used as luminophores; the foregoing when adapted for colouring textiles and when of a kind* not made in Canada.	Free	Free

* The word 'kind' may not be the most suitable word to express our intention. In our supporting submission we will explain more fully our intended objectives."

Practically all of the colouring agents that would be classified under the items proposed by the P.T.I. now qualify for duty-free entry under tariff items 203, 203a, 203b, 203c and 203d; thus, the proposal does not involve any significant change in tariff treatment. However, some of the products which are now entered under the existing items might be excluded from the proposed items for heading 32.05 and 32.07 because of the phrase "when of a kind not made in Canada". They, presumably, would become dutiable under the residual rates proposed by the Committee for the headings. In explaining the intended objective of the not-made provision, the P.T.I. spokesman stated:

"Our requirements are very specific. To match a colour, a shade which is 'similar' is not sufficient. Our interest can not be expressed merely in terms of colour without regard to the nature of the goods to which the colouring material is to be applied. We cannot accept a set of criteria based on chemical analysis, which fails to take account of physical factors such as particle size, which might be essential to our ability to satisfactorily employ a product. In summary, we cannot approach the subject of 'made in Canada' status from the view point of chemical description. We are concerned only with the results produced in the application of various chemicals to our varied and continuously changing products. It is therefore our intent

and desire that in considering availability from Canadian sources of a material, we look at its ability to achieve a desired result, under the specific set of circumstances involved."⁽¹⁾

Referring specifically to the extract from heading 32.05 pertaining to synthetic organic pigments, the P.T.I. explained the intended scope of the not-made-in-Canada provision in relation to this item as follows:

"as noted above, it is our intention that this criterion take account not only of distinctions as to chemical composition, but also physical criteria such as fineness of grind, qualitative criteria such as purity, and subjective considerations involving suitability for use in differing textile processes and on differing types of fibres."⁽²⁾

It is evident that, interpreted in this way, the scope of the not-made-in-Canada provisions would be extremely broad, being predicated on the suitability of a product for a particular application "under the specific set of circumstances". The practical difficulty to Canadian manufacturers of pigments and the administrative feasibility of such a provision were the subject of considerable discussion at the public hearing between the Color Makers Association and the Primary Textiles Institute, particularly with regard to the degree of substitutability of Canadian-made and imported pigments. A spokesman for the Institute also noted that there was an advantage in ordering a full range of colours from one supplier, and no Canadian producer could offer the range which might be required.

Entry under two of the proposed items is qualified by the phrase "adapted for colouring textiles" and under another by the phrase "when for colouring textiles". No end-use restriction was incorporated into the proposed extracts from heading 32.05 pertaining to synthetic organic dyes on the grounds that:

"there is no Canadian manufacturing industry, no duty rates have been proposed to you by anyone, and there has been no suggestion that the development of such an industry could be anticipated as a result of any degree of tariff protection which this Board might recommend."⁽³⁾

However, a spokesman for the P.T.I. stated that the Institute would not object to attaching a not-made-in-Canada criterion to this proposed item.

With respect to the phrase "adapted for" in two of the proposed items, the Institute noted:

"this phrase has been used in existing Canadian Customs Tariff items 203, 203a, 203b and 203c. They have in the context of these Tariff Items been interpreted as meaning 'suitable for use in'. This has seemed to us to be sub-

(1) Transcript, Vol. 94, p. 14302

(2) Same, Vol. 94, p. 14303

(3) Same, Vol. 94, p. 14303-4

stantially the same meaning which appears to lie in the phrase 'of a kind used as', which is in many items in the Brussels Nomenclature, including Headings 32.05, 32.07, 32.08 and 32.09."⁽¹⁾

In support of its request for continued duty-free entry of the colouring agents used in textile applications, the P.T.I. stated:

"The Primary Textiles Institute has supported the principle that Canadian industry should receive a reasonable degree of protection, to encourage development of production in this country. This is the position which we have taken in regard to production of textiles, and we take no different position in respect of production in Canada of those materials which we consume in our manufacturing operations. At the same time, as an industry subject to intense competition from imported textiles, it is essential that we continue to receive access at the lowest possible cost to materials which are not made in Canada. Colouring materials may be made in Canada, to specifications suitable for other uses but not for use in the production of textiles. Should the Board recommend duty rates for the protection of this Canadian production, it should exercise care to define the protected areas, to avoid denying us access to materials which we are forced to import because of lack of availability from Canadian sources of products suitable for our use."⁽²⁾

The Institute estimated that at the time of the public hearing total annual purchases of colouring materials, including intermediates, by Canadian textile mills substantially exceeded \$10 million. With the exception of titanium dioxide, all were said to be imported because of lack of production in Canada of materials suitable for textile applications. A spokesman for the Institute estimated that, on a dollar basis, the distribution between dyes and pigments was in the ratio of about four to one. The P.T.I. was unable to indicate the approximate distribution of imports under the items which it had proposed.

As noted earlier in this section, synthetic organic dyes have never been manufactured in Canada on a commercial scale. Imports in 1964 were valued at \$17 million, of which some 70 per cent, or about \$12 million is believed to have been for textile applications.

On the other hand, both organic and inorganic synthetic pigments have been manufactured in Canada in substantial quantities. Although, as noted earlier, Canadian manufacturers make about 35 basic chemical types of synthetic pigments, comprising some 200 different formulations some of which may fall within the broad categories of pigments suitable for textile applications, they have not been producing the exact formulations required by the textile industry. This may be due to such factors as the technical considerations mentioned in the P.T.I.'s submission, the relatively great and ever-changing variety of colours required by the textile industry and the tendency

(1) Transcript, Vol. 94, p. 14301-2

(2) Same, Vol. 94, p. 14305-6

on the part of the textile industry to follow trends in colours developed in the United States. Moreover, the total use of pigments by the textile industry is relatively small. In 1964, for example, imports of pigments for textile applications, under tariff item 203d, were valued at just over one million dollars; this may have included natural pigments and types of synthetic pigments which are not made in Canada. Thus, while there appears to be no technical reason why synthetic pigments for textile applications could not be made in Canada, and a number of closely related pigments are made in Canada, it is unlikely that Canadian manufacturers of synthetic pigments will, for some time, find it economical to supply a significant share of the somewhat specialized, varied, constantly changing and, on the whole, relatively small requirements of the textile industry.

Burrell & Company Limited of London, England, made representations on behalf of three subsidiary companies in the United Kingdom concerning the products classified by B.T.N. 32.05, 32.06 and 32.07. In its written submission, the company requested that there be no change in the British preferential margin based on duty-free entry under the British Preferential Tariff and a rate of 5 p.c., under the Most-Favoured-Nation Tariff for pigments not made in Canada or for those pigments for which the Canadian producers cannot satisfy a substantial portion of the market. The company noted that there were factors which gave Canadian manufacturers certain advantages over their counterparts in Britain such as lower freight costs, duty-free entry of dyes and intermediates into Canada and proximity to the market.

B.T.N. heading 32.08 covers a wide range of colouring and other preparations used in the ceramic and glass industries and in coating of metal articles. The complete wording of the heading is as follows.

"Prepared pigments, prepared opacifiers and prepared colours, vitrifiable enamels and glazes, liquid lustres and similar products, of the kind used in the ceramic, enamelling and glass industries; engobes (slips); glass frit and other glass, in the form of powder, granules or flakes."

Prepared pigments, prepared opacifiers, prepared colours and liquid lustres are at present classified mostly under tariff items 246, 246b and 246c. Vitrifiable enamels and engobes, or slips, would very likely be entered mostly under item 220a(i). Glass frit is classified under tariff item 711.

In a statement respecting heading 32.08, the Industry Committee spokesman said that all products covered by this heading which currently are known to have commercial importance are dealt with in the producer's submission. The only representations which the Board received respecting the products classified under heading 32.08 were those by Ferro Enamels (Canada) Limited and concerned the ceramic and glass colours now entered under tariff items 246, 246b and 246c.

Ferro Enamels (Canada) Limited, of Oakville, Ontario, proposed rates of 15 p.c., B.P. and 20 p.c., M.F.N. for the products classified under B.T.N. heading 32.08. A spokesman for the company suggested that the prepared opacifiers of this heading be excluded from it on the grounds that they are mostly chemically defined products such

as tin oxide, zirconium silicate and titanium oxide.⁽¹⁾ However, chemically defined products are classified under relevant headings mainly of Chapters 28 and 29. Those opacifiers which are classified in heading 32.08 would clearly not be classified elsewhere in the B.T.N. The spokesman for the Industry Committee said that, in the Committee's survey of the chemical industry, it had received no reports suggesting that the prepared opacifiers classified under heading 32.08 were of commercial significance.⁽²⁾

A large part of the imports which would be classified in heading 32.08 are reported in the trade statistics as "ceramic, enamelling and glass paints," s.c. 428-33. In the table below the published data are shown for 1964. The data relate to imports under items 246, 246b, 246c, 247, 249 and 711.

Imports of Ceramic, Enamelling and Glass Paints, 1964

<u>Imports</u>	<u>Unit</u>	<u>B.P.</u>	<u>M.F.N.</u>	<u>Total</u>
Total	\$'000	291	1,492	1,783
Duty-Free	\$'000	204	427	631
Dutiable	\$'000	87	1,065	1,152
Dutiable as % Total	%	30	71	65
Duty Collected	\$'000	10	205	215
<u>Duty as % of:</u>				
Dutiable Value	%	11.5	19.2	18.7
Total Value	%	3.4	13.7	12.0

The above imports would be entered mainly under item 246b at rates of Free, B.P. and 20 p.c., M.F.N., or under item 246c, free of duty under all Tariffs. In the proposal of Ferro Enamels, imports under item 246c would be subject to a substantial increase in rates; imports under item 246b from B.P. countries would become dutiable at 15 p.c., instead of being entered free of duty and the margin of preference would be reduced from 20 p.c. to only five percentage points.

In support of its proposal for duties of 15 p.c., B.P. and 20 p.c., M.F.N., on products of heading 32.08, Ferro Enamels stated:

"For many years, glass colours have been imported free of duty from most favoured nations under Tariff Item 246c, which in our opinion, is not a proper description of these materials. We suggest that they be included in Brussels Technical Nomenclature 32.08 and, as our company is now manufacturing a complete line of glass colours in Canada, that they be subject to the rates of BP 15% and MFN 20% which we are recommending for all items included under this heading."⁽³⁾

(1) Transcript, Vol. 98, p. 14908

(2) Same, Vol. 98, p. 14910

(3) Same, Vol. 98, p. 14901

Ferro Enamels is the only known Canadian manufacturer of these preparations. The size of the Canadian market for these products is not known but imports in 1964 were valued at \$1.8 million. The available information suggests that, at least at the time of the hearing, Ferro Enamels was essentially a producer of glass frit and vitrifiable enamels; the company's production of glass colours was probably a relatively small part of its operations at that time. The Board contacted several large users of glass colours in order to obtain information on volume of use and sources of supply. The replies indicated that, up to that time, Ferro Enamels could supply only a very small part of Canadian requirements mostly for reasons unrelated to the level of tariff protection.

The proposals dealt with in the foregoing were related to specific headings of Chapter 32 or to heading 25.09. In addition, the Tanners Association of Canada and the Rubber Association of Canada made representations regarding certain tariff items which relate to goods classified in B.T.N. headings 32.04 to 32.08 and heading 25.09; a discussion of these follows.

As noted in the section on tanning preparations and related products earlier in this volume, the Tanners Association of Canada requested that tariff items 203, 203a, 203b, as well as certain others covering products of interest to the Association, be retained without any change that would result in an increase in the rates of duty on the products imported under them. The Association also stated that it was not opposed to changes in the wording or grouping of tariff items designed to bring them into conformity with the Brussels Nomenclature.⁽¹⁾ With respect to the products under discussion in this section, the Association said in its submission:

"Aniline dyes are ... vitally important in producing leathers, not only for the world of colour in high fashion leather, but in every day leathers as well. No dyes of any suitable kind are presently made in Canada and it is understood that the combination of a small domestic market together with the very high capital cost involved in producing aniline dyes will prohibit the manufacture of such products in the foreseeable future..."⁽²⁾

The total consumption of dyes by Canadian leather tanneries was valued at \$865,000 in 1963. There is no evidence that aniline dyes for this or any other use are manufactured in Canada. Aniline dyes are classified in heading 32.05 as synthetic organic dyestuffs.

The Rubber Association of Canada made written representations concerning the dyes, pigments and pigment dispersions which its members import under tariff items 203b, 203c, 203d, 240, 246 and 247. The Association stated that "the Canadian rubber industry is subject to severe import price competition and can ill afford to be burdened with the additional cost handicaps which would tend to follow tariff increases on its raw materials", and urged the Board "to give due weight to this consideration in its deliberations..."⁽³⁾

(1) Transcript, Vol. 95, p. 14418

(2) Same, Vol. 95, p. 14441

(3) Same, Vol. 96, p. 14466

The Canadian Pulp and Paper Association expressed an interest in synthetic organic dyestuffs (32.05), lithopone (32.07) and titanium dioxide pigments (32.07). The spokesman for the Association urged that rates of duty on materials used by the industry should not be increased. In a general submission, the Association supported this position on the grounds that such increases would be reflected in costs and would make it more difficult for the pulp and paper companies to compete in world markets.⁽¹⁾

⁽¹⁾ Transcript, Vol. 96, p. 14467; Vol. 36, p. 5246

VARNISHES AND LACQUERS; DISTEMPERS; PREPARED WATER PIGMENTS OF THE KIND USED FOR FINISHING LEATHER; PAINTS AND ENAMELS; PIGMENTS IN LINSEED OIL, WHITE SPIRIT, SPIRITS OF TURPENTINE, VARNISH OR OTHER PAINT OR ENAMEL MEDIA; STAMPING FOILS; DYES IN FORMS OR PACKINGS OF A KIND SOLD BY RETAIL - B.T.N. 32.09

Heading 32.09 of the B.T.N. relates mainly to preparations which are used to apply decorative or protective finishes to the exterior or interior surfaces of homes and buildings, to the structural components of buildings, and to an immense variety of other goods. The heading includes the varnishes, lacquers, paints, enamels and distempers which account for most of the output of the paint and varnish industry. It also applies to pigments intimately dispersed in paint or enamel media, to water pigments used for finishing leather, to stamping foils, to pearl essence and to dyes in forms or packings of a kind sold by retail.

The heading excludes certain products such as nail varnishes, hair dyes, theatrical grease paints and other make-up, all of which are classified in heading 33.06. It excludes metallic foils produced by rolling or hammering (headings 71.07, 74.05 and others) artists' and students' colours in tablets, tubes, bottles or similar packings (heading 32.10) and printing inks (heading 32.13). The heading also excludes concentrated dispersions of colouring matter in plastic or rubber (headings 32.05, 32.06 and 32.07), prepared pigments in solid form (32.08) and certain other preparations which are specified in the Explanatory Notes to the Brussels Nomenclature.

The goods which are classified in heading 32.09 are entered mainly under tariff items 247 and 249; some are also entered under items 220a(i), 244, 246, 247, 247b, 251, 252 and 921. However, in terms of the value of goods which would be protected by the existing Tariff, items 247 and 249 are of greater importance than any of the others. Item 247 relates generally to paints, including special purpose paints, and item 249 to varnishes, lacquers and other such finishes. A tabulation of imports under these two items, in 1964, shows that the duty collected on products classified in heading 32.09, averaged the equivalent of 15.0 p.c., B.P. and 18.8 p.c., M.F.N. Ninety-five per cent of these imports were from M.F.N. countries, mainly the U.S.A.

The estimated Canadian market for the products under consideration exceeded \$175 million in 1963. Canadian production supplied 97 per cent of domestic use. Imports in 1963 were only \$5.5 million and exports were only \$900,000. The average duty collected on imports was approximately 18½ p.c.

The Products

The decorative and protective coatings under consideration consist, generally, of colouring matter dispersed in a liquid medium known as the vehicle. The vehicle consists of a non-volatile, film-forming portion, known as the binder, and a volatile solvent designed to facilitate application, known as the thinner. The coating preparations may also contain additives such as driers, emulsifiers, stabilizers and anti-foam agents.

The three broad categories into which the coatings may be classified are described in the Explanatory Notes to the Brussels Nomenclature in the following terms.

1. Varnishes and lacquers:

"Varnishes and lacquers are solutions or dispersions containing film producing products (e.g., linseed oil, cellulose nitrate, natural or artificial resins, gums, oleoresins, etc.), non-film producing ingredients (generally driers or plasticisers) and a diluting agent or volatile solvent (spirits of turpentine, ketone solvents, etc.) They may also contain colouring matter in solution. They form a dry, more or less transparent or translucent and frequently brilliant film on the surface to which they are applied."

2. Paints and enamels:

"These are dispersions of insoluble colouring materials (chiefly mineral or organic pigments or colour lakes), or metallic flakes or powders, in a mixture of a film producing agent with a drier, solvent or diluent. In certain cases the colours are mixed with a prepared varnish. They form a dry, opaque film of colour, glossy or matt, on surfaces to which they are applied."

"They include: oil paints; cellulose paints; bituminous paints; paints containing natural or artificial resins. Certain paints with a varnish base are known as varnish paints and enamel paints. Also included are paints to which certain special products have been added for particular purposes, e.g., anti-fouling paints for ships' hulls containing toxic materials, luminous paints, etc."

3. Distempers, whitening for footwear and water pigments for leather:

"Distempers are essentially composed of colouring pigment or of mineral substances (e.g., whiting) with certain quantities, usually very small, of binders such as skin glue or casein. Fillers, insecticides or antiseptics are incorporated in some types."

"Distempers include gelatinous white, casein distempers and silicate distempers. They are usually in powder form, but may be imported as pastes or emulsions."

"Whitening for cleaning footwear consists of whiting agglomerated in tablets by means of a binder (e.g., dextrin or skin glue). They are varieties of distempers."

"Water pigments for finishing leather are preparations similar to ordinary distempers, consisting of mixtures of mineral or organic pigments and certain quantities of binders (e.g., caseinates). They are in the form of powders or pastes or dispersions in water, and sometimes incorporate products designed to give a brilliance to leather."

Paints are usually further classified as oil-base or water-base depending on whether an organic solvent or water is used as the

thinner. Water-base paints have been becoming increasingly important in recent years, particularly those based on latex emulsions.

Varnishes and lacquers may be of different types. They are described as follows in the Explanatory Notes.

- "(1) Oil varnishes of which the film producing ingredient is a mixture of a drying oil (e.g., linseed oil, tung oil, etc.) with gums or natural or artificial resins (e.g., oleoglycerophthalate resins).
- "(2) Cellulose varnishes and lacquers (based on cellulose nitrate and other cellulose derivatives).
- "(3) Other varnishes and lacquers, not containing drying oils, consisting generally of solutions or dispersions of gums or natural resins (shellac, copal, rosin, damar, etc.) or artificial resins (novolacs or other phenoplasts, aminoplasts, silicones, etc.) in alcohol (spirit varnishes), spirits of turpentine, white spirit, acetone, etc.
- "(4) Varnishes based on bitumen, pitch and similar products, (sometimes known as black japans, black varnishes, etc)."

As noted earlier, heading 32.09 also relates to pigments in certain media, stamping foils and dyes in retail packings and to pearl essence. The Explanatory Notes describes them as below.

Pigments in certain media:

"The present heading also includes crushed pigments intimately dispersed in paint or enamel media (e.g., drying oils, white spirit, turpentine or varnish). They are put up as liquids or pastes; however, pigments in water are classified in their appropriate headings.

"The heading does not include concentrated dispersions of colouring matter in plastic, rubber, etc., of a kind not used in the manufacture of paints (heading 32.05, 32.06 or 32.07 according to the nature of the goods). Prepared pigments in solid form are classified in heading 32.08 (prepared pigments of the kind used in the ceramic, enamelling and glass industries), heading 32.09 (distempers and prepared water pigments of the kind used for finished leather) or otherwise in headings 32.05 to 32.07, as the case may be."

Stamping foils:

"these products (also known as blocking foils) consist of either:

- (1) Thin sheets composed of metallic powder (including powder of precious metal), or pigment, agglomerated with glue, gelatin or other binder.
- or
- (2) Metal or metallic powder (e.g., gold or aluminium), or pigment, deposited on paper, artificial plastic material or other support, by vaporisation, cathodic sputtering, etc.

"They are used, with the application of pressure (and generally of heat), for printing book covers, hat bands, etc., by hand or machine.

"Metallic foils produced by rolling or hammering are classified according to the constituent metal (e.g., gold foil in heading 71.07, copper foil in heading 74.05 and aluminium foil in heading 76.04)."

Dyes in retail packings:

"These are non-film forming products which normally consist of mixtures of colouring matter with other substances (e.g., inert diluents, surface-active products which encourage the penetration and fixation of the colouring matter). Mordants are also sometimes added.

"They fall here only if: (i) in retail packings (e.g., sachets of powder, bottles of liquid) put up for use as dyes, or (ii) in forms (e.g., balls, tablets or the like) clearly designed for retail sale.

"The dyes covered by this heading are mainly those used for domestic purposes and usually sold as "household dyes" (e.g., dyes for clothes, for shoes, for furniture). The heading also includes special dyes used in laboratories, e.g., to colour microscopic preparations."

Pearl essence:

"This heading also includes the product known as "pearl essence"; this consists of a suspension, in a binder usually formed of cellulose nitrate and amyl acetate, of flakes of guanine obtained from the scales of certain fish (e.g., the bleak or ablet) generally by treatment with ammonia. This product is used for the manufacture of imitation pearls."

Varnishes are used in considerable quantity as binders in the manufacture of enamels; they form an opaque film of varying degrees of gloss on surfaces to which they are applied. Anti-corrosive paints contain rust-inhibiting ingredients such as red lead, graphite or lead and zinc chromates; anti-fouling paints contain poisonous materials such as white arsenic or mercury oxide.

Solutions of colouring matter in a liquid medium, usually an organic solvent, but without a binder are known as stains. These differ from coatings such as paints or varnishes in that they do not form a film on the surface to which they are applied. Stains are used principally on wood to deepen or otherwise modify its natural colour without obscuring its grain or texture.

The general, descriptive names such as "paint", "enamel" or "varnish" are not precise either in common or commercial usage. To some degree the names are different in different countries and sometimes the same names are applied to different products by different manufacturers.

Manufacturing Processes

The basic processes involved in the manufacture of decorative and protective coatings are essentially the same, although the materials used in making them may differ significantly.

The manufacturing operation usually begins with the dispersion of dry, fine pigments in an appropriate vehicle. This is accomplished by mixing the ingredients in a mixer equipped with rotating blades or paddles. The resulting mixture, usually in the form of a stiff, thick paste, is then subjected to a grinding process on a roller mill, or similar grinding machine, to disperse the pigment properly in the vehicle. The paste is then thinned with an appropriate solvent to achieve the desired consistency; this is usually done by agitation in tanks. Afterwards, in an operation referred to as tinting, the colour of the coating is brought to the required standard by the addition of carefully controlled amounts of tinting paste containing highly concentrated pigment. After final testing by the plant laboratory, the finished product is screened, filtered and packaged. In Canada, the manufacture of protective and decorative coatings is, as a rule, a batch operation, individual batches ranging generally between 100 to 200 gallons each, depending on type.

It is apparent from the foregoing that the manufacture of decorative and protective coatings, on the whole, entails a series of mechanical operations utilizing relatively simple equipment and little direct labour. The evidence given at the public hearing suggested that, on the average, only about 20 per cent of the factory cost of surface coatings is attributable to factors other than materials.⁽¹⁾ As is evident in a later table, the cost of materials represents about 50 per cent of the value of shipments.

Certain phases of the production process, including tinting, testing and final approval, require highly skilled technical personnel and extensive laboratory facilities. In addition, most of the large manufacturers of coatings in Canada, particularly those producing industrial coatings, undertake developmental work. These activities involve relatively costly and complex equipment and highly specialized staff. Although most of the expenses associated with these activities do not enter directly into the cost of manufacture, they nevertheless constitute an element of cost and have a bearing on the over-all cost structure of the industry.

The Manufacturers

The decorative and protective coatings, as well as some of the other products considered in this part of the report, are manufactured by what has traditionally been known as the paint and varnish industry. In 1963, this industry included 128 firms operating about 145 plants, which accounted for more than 95 per cent of the value of

(1) Transcript, Vol. 92, p. 13938

coatings produced in Canada; the remainder was made in plants classified to other industries. Sales of paints, varnishes, thinners and paint removers by plants classified in the paint and varnish industry, in 1963, were valued at more than \$150 million; sales of all products by these plants exceeded \$170 million.

Although the paint and varnish industry comprises 145 plants, 85 per cent of the value of its total output originates in about 40 plants, each with sales valued at more than one million dollars annually. The eight largest plants of this group, each having sales in 1963 in excess of \$5 million, accounted for 41 per cent of the industry's shipments. These plants are owned chiefly by large firms, most of which are engaged in the manufacture of other products as well. The large firms offer a wide range of coatings and account for most of the specialized types of finishes, such as automotive and other industrial coatings produced in Canada. The smaller manufacturers concentrate for the most part on general household and other maintenance paints, although several also produce specialized preparations.

The plants which manufacture decorative and protective coatings, although distributed throughout Canada, are chiefly in Ontario and Quebec. Of the 145 plants operating in 1963, 72 were located in Ontario, 41 in Quebec, 18 in British Columbia, 11 in the Prairies and 3 in the Atlantic Provinces. Within the provinces, the plants tend to be concentrated in the large population and industrial centres such as Toronto, Montreal, Winnipeg and Vancouver. Among the factors said to be responsible for the regional distribution of the industry were the relatively high cost of transporting the variety of coatings required by local markets; climatic and other regional differences that necessitate differences in the composition or type of coatings used; and the importance of close contact with the market's requirements, particularly for industrial and other specialized finishes developed to customers' specialized needs.

Sales of all products by the paint and varnish industry have grown very substantially in the ten years from 1954 to 1963. In this period, sales rose from \$108 million to \$172 million, an increase of nearly 60 per cent. A large part of this increase occurred between 1954 and 1959; the rate of expansion was somewhat slower in the early 1960's. Sales per person did not increase as rapidly as total sales; in 1954 factory shipments per employee amounted to \$18,836; in 1963 shipments per employee were \$22,866, an increase of 21 per cent. Even though the number of employees did not increase as rapidly as sales, salaries and wages represented a somewhat higher proportion of the value of factory shipments in 1963 than in 1954; in the earlier year, they were about 18 per cent of the sales dollar, in 1963, more than 21 per cent. In 1954 the average annual wage per employee was \$3,431; in 1963 it was \$4,875, 42 per cent higher. The table below gives some of the principal statistics related to the industry.

Selected Statistics Related to the Paint and Varnish
Industry, 1954 - 63

<u>Year</u>	<u>Total Employees No.</u>	<u>Salaries and Wages \$'000</u>	<u>Materials Used \$'000</u>	<u>Value Added \$'000</u>	<u>Value of Factory Shipments^(a) \$'000</u>
1954	5,719	19,625	55,061	51,899	107,727
1955	5,994	20,768	59,785	58,246	117,184
1956	6,211	22,713	65,156	60,439	126,312
1957	6,316	24,288	65,591	64,528	129,384
1958	6,130	24,824	69,393	73,359	141,724
1959	6,230	26,212	71,704	75,304	147,583
1960	6,106	27,424	73,540	72,584	147,138
1961	5,802	25,848	75,066	76,956	152,358
1962	7,525	35,326	79,713	83,017	160,462
1963	7,511	36,618	85,967	87,906	171,752

(a) Includes products not under consideration; these account for a small portion of the total

Source: Based on D.B.S., Cat. No. 46-210

In 1963, earnings of hourly-rated employees in the paint and varnish industry averaged about \$2.00 an hour, while salaries and wages combined averaged about \$90.60 a week. These rates are somewhat higher than those paid in manufacturing generally (\$1.95 and \$86.24, respectively), but not as high as the average for the chemical industry as a whole (\$2.18 and \$101.60).

On the whole, the manufacture of decorative and protective coatings does not require complex and expensive equipment. This is reflected in a relatively low level of capital expenditures in the paint and varnish industry. During the ten-year period from 1951 to 1960, for example, expenditures by the industry on new construction, machinery and equipment amounted only to about \$5,300 per employee. The corresponding figure for the other branches of the chemical industry, taken together, is \$21,500 and the average for Canadian manufacturing industries generally is close to \$8,300.

A great variety of materials are used by the industry, some of which are captively produced from more basic raw materials. For example, most of the large manufacturers make their own synthetic resins. However, the ratio of value of purchased materials to the value of shipments has not shown any considerable change between 1949 and 1963, having been about 50 per cent throughout the period.

In 1963, the latest year for which detailed information is available, the industry purchased approximately \$86 million of materials. The major categories of purchased materials are given on the following page together with comparable figures for 1959.

Materials Purchased by Paint and Varnish Manufacturers, 1959 and 1963

	<u>1959</u>	<u>1963</u>	<u>1959</u>	<u>1963</u>
	million dollars		% of total	
Prime pigments	18.0	20.1	24.8	23.5
Extenders	2.3	3.1	3.2	3.6
Oils	7.2	7.1	9.9	8.3
Resins	10.1	12.4	13.8	14.4
Shellac	0.5	0.4	0.7	0.5
Solvents	8.9	9.5	12.2	11.1
Driers	0.8	0.9	1.1	1.0
Miscellaneous	8.7	9.6	11.9	11.2
Containers, packages etc.	10.2	11.1	14.0	12.9
Other	<u>6.1</u>	<u>11.7</u>	<u>8.4</u>	<u>13.5</u>
	73.0	86.0	100.0	100.0

Source: Compiled from D.B.S., Cat. No. 46-210

Material costs of 50 per cent of the value of sales are somewhat higher than in the other sectors of the chemical industry (about 43 per cent), but not much different than in manufacturing industries generally (54 per cent). In a survey of its members, the Canadian Paint Varnish and Lacquer Association (CPVLA) found that 63 per cent of the cost of materials used by them, in 1961, consisted of chemicals and related products under review in Reference 120. About one-third of these was imported, of which one-third was entered free of duty; the remainder was subject to rates mainly of from 15 to 20 per cent.

The published "Taxation Statistics" indicate that in the years 1958 to 1962 paint and varnish manufacturers realized a gross margin over the cost of goods sold equivalent to between 34 and 37 per cent of net sales. This is considerably more than the gross margin of between 26 and 28 per cent realized by Canadian manufacturing industries generally. However, after allowing for selling, administrative, research and financial expenses, the paint and varnish industry earned a net profit (after income tax) on net sales of between 2 and 4½ per cent, with a tendency towards the lower figure in the early 1960's. In most years, this ratio was below the average for Canadian manufacturing generally. It is evident from this that in the paint and varnish industry, the expenses other than direct factory cost of manufacture were claiming a larger portion of the sales dollar than was the case for Canadian manufacturing generally. Moreover these other expenses have tended to become relatively more important in recent years. According to the CPVLA, this is one of the factors which contributed most to lower profits in recent years.⁽¹⁾ The increase in other expenses was said to be attributable chiefly to increased selling expenses associated with intense competition within the industry.

The average return on net worth, or shareholders' equity, obtained by firms engaged in the manufacture of paints and varnishes

⁽¹⁾ Transcript, Vol. 92, p. 13905

has been comparable with that prevailing in manufacturing generally. This lends support to the conclusion expressed in the industry's submission that the over-all profitability in the paint and varnish industry has been reasonably satisfactory compared with other industries.

The Market

The estimated Canadian market for the range of products classified in heading 32.09 increased by 58 per cent in the decade from 1954 to 1963. In 1954 sales of these products in Canada were valued at just under \$100 million; in 1963 sales were \$156 million. Canadian manufacturers supplied almost all domestic requirements, imports amounting to only three or four per cent of domestic use. Imports have been fairly stable in recent years, at approximately \$5.5 million annually; exports have been around \$1 million annually, though they appear to have fallen off somewhat in 1963 and 1964.

The Canadian Market for Products of Heading 32.09, Selected Years, 1954 - 64

	<u>Shipments</u>	<u>Imports</u> \$'000	<u>Exports</u>	<u>Canadian Market(a)</u>	Imports as a Per cent of Market %
1954	96,681	2,662	599	98,744	2.7
1957	117,538	3,628	1,058	120,108	3.0
1960	132,197	4,988	929	136,256	3.7
1961	136,601	5,510	1,315	140,796	3.9
1962	142,377	5,667	921	147,123	3.9
1963	151,823	5,376	863	156,336	3.4
1964	..	5,675	738	..	..

(a) Shipments plus imports less exports

Source: D.B.S., various publications

In the ten years, 1954 to 1963, shipments of paints and allied products by Canadian manufacturers increased by about \$55 million. Shipments of oil-based paints increased by \$38 million and of latex-base paints by \$12 million; shipments of other products increased by \$5 million. Most of the increase in shipments of oil-based paints was accounted for by the larger sales of ready-mixed exterior paints, sales of which rose from \$34 million in 1956 to \$54 million in 1963. In the period 1954-63, latex-based paints were used almost entirely for interior use. Thus, it appears that the lack of expansion in the use of oil-based interior paints resulted from the substitution of latex emulsion paints for this application. The relative importance of the major products is shown in the table which follows.

Shipments of Paints, Varnishes and Related Products
of Heading 32.09, 1954, 1959 and 1963

	<u>1954</u>	<u>1959</u> \$'000	<u>1963</u>	<u>% change</u> <u>1954-63</u>
<u>Oil-based Paints</u>				
Paste & semi-paste	713	716	597	-16
Ready-mixed-exterior)	69,163	43,514	53,657	+57 ^(a)
-interior)		<u>52,273</u>	<u>53,785</u>	<u>+13^(a)</u>
Total Oil-based	<u>69,876</u>	96,503	108,039	+55
<u>Water-thinned Paints</u>				
Latex base	9,538	14,706	21,368	+124
Other	<u>1,606</u>	<u>2,039</u>	<u>1,898</u>	<u>+18</u>
Total Water-thinned	11,144	16,745	23,266	+109
<u>Lacquers</u>	6,847	9,301	9,949	+45
<u>Stains</u>	894	1,103	1,165	+30
<u>Varnishes</u>	7,921	9,503	9,021	+14
<u>Colours in oil</u>	..	<u>236</u>	<u>383</u>	<u>..</u>
Total	<u>96,682</u>	133,391	151,823	+57

(a) 1956 to 1963

Source: Compiled from D.B.S., Cat. No. 46-210

The market for decorative and protective coatings consists of trade sales and industrial sales. Trade sales are to the general public, painters and painting contractors, usually through intermediate distributors. Most of the coatings sold in this way are in retail containers and include such large volume products as exterior and interior house paints. Industrial sales are usually made directly to industrial users, frequently on the basis of bids submitted by individual paint manufacturers. They include automotive, appliance, furniture and other similar finishes, coatings for food and beverage containers and other special finishes used by industry. Many of the products are developed to meet the customer's individual requirements.

The manufacturers estimated that about 60 per cent of the value of sales was trade sales and 40 per cent was industrial sales. They also said that competition is greater in the field of industrial sales and this tends to keep prices low.

Prices of decorative and protective coatings vary widely and depend on type, quality and the level of distribution. In 1965, fairly representative industrial finishes were priced at about \$3.00 a gallon and trade paints at about \$4.50 a gallon to wholesale distributors and large contractors buying directly from manufacturers. Painting contractors purchasing from dealers paid about \$6.00 a gallon and the general public, buying the same paint in small quantities, paid about \$8.50 a gallon at retail. Prices of coatings have increased in recent years with prices of latex emulsions increasing somewhat faster than those of the other main types.

Quite apart from any effect that protective tariffs might have, the relatively low level of imports and exports may be attributable in part to the same factors which, as noted earlier, gave rise to regional distribution of plants in the industry. The CPVLA stated that it is generally uneconomical to trade internationally in the trade-type paints and that paint trade between industrialized nations is restricted mostly to industrial and specialty finishes.⁽¹⁾ Special tabulations of imports suggest that, apart from products packed in aerosol cans, specialized industrial finishes made up about two-thirds of the imports in 1961 and house paint and architectural finishes one-third. Imports in pressurized aerosol cans were 16 per cent of the value of total imports. The CPVLA attributed imports to such factors as advertising, the fact that many architectural and manufacturing specifications are prepared in the U.S.A., and to the lower cost of aerosol paints in the U.S.A.

Imports are principally from the U.S.A.; in recent years more than 95 per cent by value of imported coatings originated in that country. The CPVLA claimed that factory selling prices in Canada, on the average, are comparable to those of similar goods in the U.S.A., and that the delivered cost of coatings imported from that country is generally higher than for products of equivalent quality manufactured in Canada.⁽²⁾

Customers personal preferences, the tendency of foreign subsidiaries to follow specifications developed by parent companies, and advertising were cited as the principal reasons for continued importations from the U.S.A. despite competitive domestic prices and the availability of most of the coatings in Canada.

The comparability of prices in Canada and the U.S.A. suggests that the Canadian paint and varnish industry has not been taking advantage of the existing tariff, on average about 18.5 p.c., M.F.N., to maintain higher prices in the Canadian market. At the public hearing, the CPVLA said:

"this Industry has developed in Canada without taking advantage of the tariff as far as its pricing policies are concerned."⁽³⁾

Tariff Considerations

Heading 32.09 of the B.T.N. includes the following kinds of products: varnishes and lacquers; distempers; paints and enamels; pigments in linseed oil, white spirit, spirits of turpentine, varnish or other paint or enamel media; prepared water pigments of the kind used for finishing leather; pearl essence; stamping foils; and dyes in forms or packings of a kind sold by retail. These goods are classified in the Canadian Customs Tariff mainly in the tariff items given in the following abridged form.

(1) Transcript, Vol. 93, p. 14089

(2) Same, Vol. 93, p. 14064

(3) Same, Vol. 93, p. 14106

<u>Item and short description</u>		<u>B.P.</u>	<u>M.F.N.</u>
203b	Aniline and coal tar dyes in packages over one pound.....	Free	Free
244	White lead ground in oil	20 p.c.	25 p.c.
246	Oxides, etc., colours, dry, n.o.p.....	12½ p.c.	17½ p.c.
247	Anti-corrosive and anti-fouling paints, and ground and liquid paints, n.o.p.....	17½ p.c.	20 p.c.
247b	Pearl essence for imitation pearls	Free	Free
248	Paints and colours, ground in spirits and all spirit varnishes and lacquers.....per gallon	75¢	85¢
249	Varnishes, lacquers, japans...and oil finish, n.o.p.....per gallon	15¢	20¢
	and	5 p.c.	15 p.c.
251	Gold liquid paint.....	15 p.c.	22½ p.c.

Some of the goods of heading 32.09 are also entered under more general items, including 220a(i) at rates of 15 p.c., B.P. and 20 p.c., M.F.N.; item 246 at rates of 12½ p.c., B.P. and 17½ p.c., M.F.N.; item 252 at rates of 12½ p.c., B.P. and 17½ p.c., M.F.N; and item 921, when of a kind not made in Canada, free of duty under both the B.P. and M.F.N. Tariffs.

The information indicates that, in 1964, of more than \$4 million of dutiable imports, almost all were from M.F.N. countries; the average rate of duty was approximately 18 p.c. Over half of the imports were under tariff item 247 and 249; something over one-third of dutiable imports were entered under tariff items 220a(i), 246 and 248, taken together.

The value of imports under various tariff items is not necessarily a good measure of the protection accorded to producers in Canada by the various rates of duty. The more effective the smaller the value of imports is likely to be. The significance of the protection, therefore, is more appropriately considered in terms of its effect on production, prices and the demand for the products in Canada.

In the course of the inquiry, the Board received nine submissions concerning the products under discussion. Five of these dealt with one or more of the broad categories of products included in B.T.N. heading 32.09 or in the existing tariff items; the remaining four submissions related to specific products such as bronze and aluminum pastes, and pearl essence.

The Canadian Paint Varnish and Lacquer Association Incorporated (CPVLA) made representations on behalf of the Canadian paint and varnish industry. Members of the Association were said to have accounted for 84 per cent of the total volume of paint sold by Canadian paint manufacturers in 1960. Of the CPVLA's total membership of more than 150 firms, 87 associated themselves explicitly with the Association's submission. Only one company, Du Pont of Canada Limited, notified the Board that it did not agree with many of the statements

made in the submission; however, the company did not explain the nature of its objections.

In its submission, the CPVLA requested rates of 10 p.c., B.P. and 20 p.c., M.F.N., on all paint products described in sections (A) and (C) of the Explanatory Notes to the Brussels Nomenclature; these relate to varnishes and lacquers, and to paints and enamels, respectively and would provide for most of the decorative and protective coatings under consideration.

In general, the effect of the Association's proposal would be to decrease the average rate of protection for B.P. imports and to increase the average rate for M.F.N. imports. However, the effect of the proposal on the rates for particular kinds of goods would not be uniform. This is also true for the margin of preference under different items.

The evidence cited previously indicates that in the manufacture of paints, on the average, about 70 per cent of the total factory cost is represented by the cost of purchased materials, most of which are either duty-free or dutiable at rates below those applicable on finished coatings. From this it is evident that the effective level of protection on the manufacturing operation would be much higher than that indicated by the nominal, proposed rates of duty.

In support of its proposal, the Association said that the application of uniform rates of duty to all paint products was desirable from the point of view of customs administration.⁽¹⁾ With respect to the proposed rate of 10 p.c., under the British Preferential Tariff, the Association stated:

"An analysis of imports of paints from the U.K. indicates that these are negligible;...

"We do not believe that imports from the U.K. or other Commonwealth preference areas are likely to increase, either under the existing rates or under the proposed rate of 10% ad valorem. However, we do not feel that the rate should be any lower than 10%; a rate of, say, 0% might be an unnecessary encouragement for low-priced exports [from Commonwealth countries]

...
 "We feel that the 17½% rate [under tariff item 247] is unnecessarily high on the basis of past experience dealing with actual or potential imports from Commonwealth sources."⁽²⁾

The CPVLA cited the following to be among the reasons for the proposed rate of 20 p.c. under the Most-Favoured-Nation Tariff:

"A rate of 20% (Item 247) or an ad valorem equivalent of 20% (Item 249) is the actual rate of duty levied on at least 85% of total paint imports...

(1) Transcript, Vol. 93, p. 14104, 14108

(2) Same, Vol. 93, p. 14103-4

"We have indicated elsewhere in this brief that, with an MFN rate of 20%, or a rate equivalent to 20%, this industry has developed in Canada without taking advantage of the tariff as far as its pricing policies are concerned. On the other hand, we recommend that the present level of 20% be maintained. This rate has proved to be effective and has contributed to the development of a Canadian paint industry manufacturing goods and products required by other industries and the general public without placing an unfair burden or hardship on these consumers. A lower rate may not be as effective, and we do not feel that any change should be made in this direction nor that such a change is either warranted or justified."(1)

The CPVLA's submission also contained extensive representations concerning the raw materials used in the manufacture of coatings. Most of these representations related to products classified in other Chapters of the B.T.N. and are considered elsewhere in this report under the appropriate product headings.

The Industry Committee proposed the adoption of B.T.N. heading 32.09 and rates of 15 p.c., B.P. and 20 p.c., M.F.N. on all products respecting which no proposals were made by other interests. As separate representations were received respecting all of the principal products covered by B.T.N. heading 32.09, the Industry Committee's proposal would apply only to such products as distempers, prepared water pigments of the kind used for finishing leather, stamping foils, and to dyes in forms or packings of a kind sold by retail. No specific representations respecting these products were received in the course of the public hearing, suggesting that they are not of any great significance to domestic manufacturers.

It should be noted that the water pigments and distempers for finishing leather, classified in B.T.N. heading 32.09, are now entered under tariff item 252 which is outside the terms of Reference 120. Distempers imported for use other than finishing leather, stamping foils, and dyes in forms or packings of the kind sold by retail are entered under tariff item 246. The rates under items 246 and 252 are the same, namely, $12\frac{1}{2}$ p.c., B.P., and $17\frac{1}{2}$ p.c., M.F.N. Thus, the effect of the Industry Committee's proposal would be to increase the existing rates under both the B.P. and M.F.N. Tariffs by $2\frac{1}{2}$ percentage points. The Committee did not indicate why these rates were appropriate specifically for the products to which they were intended to apply; they were the rates proposed generally by the Committee as a residual provision.

On behalf of four of its members engaged in the manufacture of synthetic coloured pigments, the Canadian Color Makers Association of Canada (CCMA) proposed that the "pigments in linseed oil, white spirit, spirits of turpentine, varnish or other paint or enamel media", covered by B.T.N. heading 32.09, be dutiable at rates of 15 p.c., B.P. and 20 p.c., M.F.N. A spokesman for the Association stated that this proposal was intended to ensure that the rates on the products

(1) Transcript, Vol. 93, p. 14106, 14108

classified in heading 32.09 were the same as those proposed for the products covered by headings 32.05, 32.06 and 32.07.⁽¹⁾

The Rubber Association of Canada made representations concerning the paints, varnishes and lacquers now entered under tariff items 247, 248 and 249. The Association said that "the Canadian rubber industry is subject to severe import price competition and can ill afford to be burdened with the additional cost handicaps which would tend to follow tariff increases on its raw materials." It went on to urge the Board "to give due weight to this consideration in its deliberations..."⁽²⁾

Items 247, 248 and 249 relate to products in headings 32.08, 32.09, 32.10 and 32.11; most of the Association's interest would appear to be in products of headings 32.09 and 32.11. In 1963, the total value of lacquers, paints and varnishes used by the industry was about one-half million dollars.

Representations respecting pigments in oil or other media, of heading 32.09, were received from A.S. Paterson Company, Limited, of Toronto, which imports dispersed and flushed pigments, or colours, for distribution in Canada. The company requested that a tariff item be established for "flushed or dispersed colour concentrates in a vehicle", with rates of $12\frac{1}{2}$ p.c., B.P., $17\frac{1}{2}$ p.c., M.F.N. The company pointed out that these are the rates which now apply to dry colours under tariff item 246. The spokesman for the company said:

"Being unable to assume what will happen to the dry colour tariff rate, we naturally have compared our product to dry colours on the present tariff basis, and in doing so our request is that flushed colours, because of their similarity in use to dry colours, should be treated at the same tariff rate."⁽³⁾

Pigments in linseed oil, spirits or other paint media are entered mostly under item 247 (if in linseed oil), item 248 (if in alcohol) and under item 220a(i) (if in mineral spirits). Thus for the most part, the proposals of the colormakers and A.S. Paterson would result in no appreciable change in existing rates of duty. The wording proposed by the company might also attract pigments in media other than those specified in B.T.N. heading 32.09, such as pigments in water, plastic or rubber. Some of these are at present classified under tariff items other than those mentioned above, for example, items 618 (in rubber), or 904 (in synthetic resin); item 618 is not in Reference 120. The proposed item would also be in conflict with headings 32.05 and 32.07 of the B.T.N.

The media enumerated in heading 32.09 include linseed oil, white spirit, spirits of turpentine, varnish or other paint or enamel media. The term white spirit is not in common use in North America where the term "mineral spirits" is used to describe the petroleum distillates used as turpentine substitutes. The Colormakers said that

(1) Transcript, Vol. 99, p. 14961

(2) Same, Vol. 96, p. 14466

(3) Same, Vol. 143, p. 21389-90

the reference to "other paint or enamel media" is not clear and, unless further clarified, might lead to administrative difficulties. The spokesman for the Canadian Color Makers Association commented on this particular provision in the following terms.

"It would be our belief that there is, notwithstanding the rules laid down in the various headings, a very real possibility of confusion as to which of the items may be appropriate for those imports of pigment in a medium because what may be a paint or enamel medium today might not be tomorrow. The technology of surface coatings is changing very rapidly, and there has been a very large increase in the number of paint media in recent years...(1)

Although the B.T.N. does not stipulate the degree of concentration and does not specify each of the "paint or enamel media", the classification of colours in oil or other media is clear. The Explanatory Notes for heading 32.05 state that "This heading applies, inter alia, to: ...concentrated dispersions of synthetic organic dyestuffs in artificial plastics, natural rubber, synthetic rubbers, plasticizers or other media. These...are used as raw materials for colouring rubber, plastics, etc., in the mass." An almost identical statement occurs in the Explanatory Notes relating to heading 32.06 (colour lakes) and heading 32.07 (inorganic colouring matter). In each case the wording, "These dispersions are used as raw materials for colouring rubber, etc., in the mass" occurs. The Explanatory Notes for heading 32.09 state that, "The heading does not include concentrated dispersion of colouring matter in plastic, rubber, etc., of a kind not used in the manufacture of paints (heading 32.05, 32.06 or 32.07 according to the nature of the goods). Prepared pigments in solid form are classified in heading 32.08..."

Thus, for classification in heading 32.09 the colours must be intimately dispersed in specified media or in "other paint or enamel media". Confusion might arise only if the medium were one which was specified in some other heading, for example, artificial plastics. The distinction would then rest on whether the colour dispersion in artificial plastic was concentrated and was used to colour rubber, plastics, etc., in the mass, and whether it was of a kind used in the manufacture of paints. Difficulties of classification should be few if the Explanatory Notes are followed.

On the basis of available information, it is estimated that Canadian shipments of dispersed and flushed pigments are valued at less than \$500,000 annually. Considerably more than one-half of this total consists of flushed pigments, most of which are produced by Standard Ultramarine & Color Company Limited, of Toronto. This firm manufactures two basic types of flushed colours, alkali blue toner and methyl violet toner, from press cake imported from the United States. The only other known Canadian company which manufactures flushed pigments for sale is McArthur, Irwin, Limited, of Montreal. At the time of the public hearing the latter offered five basic colours, two of which were made from imported press cake. Flushed pigments have accounted for only a very small portion of this company's total sales

(1) Transcript, Vol. 99, p. 14961

in recent years. At least one large manufacturer of printing inks makes flushed pigments, all of which are understood to be for captive use.

The value and variety of dispersed pigments sold by Canadian manufacturers of pigments appear to be more limited. The three largest pigment manufacturers surveyed by the Board were offering less than a dozen types of dispersions to Canadian users at the time of the public hearing. These were mostly dispersions in water which are not covered by heading 32.09. The relatively small value and variety are probably attributable to the fact that most of the large manufacturers of decorative and protective coatings and of printing inks have facilities for making their own dispersions and, consequently, commercial sales are confined to users who do not possess the necessary facilities, and to special types of dispersions.

Import statistics regarding flushed and dispersed pigments are not available. However, imports of flushed and dispersed pigments by the A.S. Paterson Company, alone, exceeded the sales by Canadian manufacturers. Several other firms are also known to distribute imported preparations of this type in Canada. Imports, like commercial sales by Canadian producers, probably consist mainly of special types of products and of relatively small quantities for users who do not have their own facilities to make dispersions. As indicated earlier, most of the large manufacturers of coatings and printing inks produce their own dispersions.

The Canadian Bronze Powder Works Limited, of Valleyfield, Quebec, requested that bronze and aluminum pastes be classified in an item worded like B.T.N. heading 32.09, at rates of 15 p.c., B.P. and 20 p.c., M.F.N. A proposal to the same effect, but related only to aluminum pastes was also made by the Aluminum Company of Canada, Limited, of Montreal. Bronze and aluminum pastes are entered under tariff item 220a(i), at rates of 15 p.c., B.P. and 20 p.c., M.F.N.

Bronze and aluminum pastes consist respectively of finely divided particles of brass and aluminum, dispersed in a solvent. Bronze pastes were said to be used mostly in the manufacture of metallic printing inks; aluminum pastes are used in the manufacture of a variety of decorative and protective coatings, such as aluminum paints.

The spokesman for Canadian Bronze estimated the Canadian market at about 45,000 pounds of bronze paste, annually, valued at approximately \$68,000. Imports supplied 30,000 pounds, or two-thirds of the total. Imports were said to consist not just of bronze paste but to include, in the same package but in a separate container, the necessary varnish to convert the paste into printing ink.⁽¹⁾ This "combination pack" is classified as printing ink and is entered under item 256, at rates of 12½ p.c., B.P. and 15 p.c., M.F.N. At the time of the hearing bronze paste was said to be priced at \$1.50 a pound and a bronze pigmented ink consisting of equal portions by weight of paste and varnish was priced at \$4.50 a pound.⁽²⁾

(1) Transcript, Vol. 99, p. 14994-5

(2) Same, Vol. 99, p. 14964

At the public hearing, the Board was informed that by far the largest part of the company's production and sales of bronze products was in the form of bronze powder; most of the imports are also of the powder form. Bronze powder is entered under tariff item 361, at rates of 12½ p.c., B.P. and 25 p.c., M.F.N.; this item is outside the terms of Reference 120. In the B.T.N., bronze powders are classified in Chapter 74.

The spokesman for Canadian Bronze estimated Canadian consumption of aluminum paste at 1.4 million pounds and said Canadian producers supplied 90 per cent of the total. At an average price of 45 cents a pound, annual Canadian use would be valued at \$630,000.

Most of the use of aluminum paste is in the manufacture of industrial paints, for example for use in the production of automotive paints. Because such industrial paints are carefully specified regarding the kinds and grades of ingredients, the principal competition would arise from the U.S.A. The Canadian price was given as 45 cents a pound and the laid-down price of the comparable U.S. product as 57 cents a pound. The spokesman for the company said that, as a result, the U.S. product was not competitive in the Canadian market.⁽¹⁾ For use in general purpose paints, the competition arose from U.K. imports. The laid-down price of U.K. aluminum paste was said to be about 42 cents a pound, about three cents a pound less than the Canadian price except where Canadian producers met this competition by lowering prices. Canadian Bronze estimated that over 70 per cent of the market in Canada was for general purpose paints.

The Aluminum Company of Canada Limited was in general agreement with the presentation by Canadian Bronze.

Canadian Bronze Powder Works Limited also made representations on behalf of The Mearl Corporation, of New York, U.S.A., concerning pearl essence which Canadian Bronze distributes in Canada for the New York company. A submission respecting this product was also received from Canadian Buttons Limited, of Montreal.

Pearl essence is a preparation used chiefly to impart pearly lustre. It may be applied as a surface coating as in the manufacture of imitation pearls, or it may be incorporated into another material as in cosmetic preparations such as lipstick and nail varnish. There are also so-called synthetic pearl essences which have some of the properties of the guanine preparation; these are mainly lead or bismuth salts incorporated in appropriate solvents. They are used in a wide variety of applications. Most would be classified in heading 32.09; others mainly in heading 32.05, 32.06 and 32.07.

Pearl essence consists of a suspension, in a binder usually formed of cellulose nitrate and amyl acetate, of flakes of guanine obtained from the scales of certain fish. Natural pearl essence ranges in price from about \$15 to \$35 a pound; the synthetic variety sells at between \$1.50 and \$13 a pound. Because of its higher price, the use of natural essence is confined to applications where its special characteristics, such as non-toxicity and immunity to sulphide, override the higher cost. Such applications include the manufacture of cosmetics, imitation pearls and certain types of plastic sheetings.

⁽¹⁾ Transcript, Vol. 99, p. 15012

The spokesman for Canadian Bronze said that sales of natural pearl essence were about \$16,000 annually and he estimated sales of the synthetic products at \$80,500, annually.⁽¹⁾ He later suggested a total market of about \$125,000, of which about 25 per cent would be the natural product.⁽²⁾

The Board was informed that pearl essence was not manufactured in Canada in 1962. The only potential Canadian supplier of natural pearl essence was said to be a company located in Nova Scotia, which was reportedly selling its entire production in crude form to The Mearl Corporation, of New York.⁽³⁾

In May 1963, subsequent to the public hearing, the Board received a written communication from Clemens Manufacturing Co. Ltd., of Brampton, Ontario, stating that the company believes itself to be the only manufacturer in Canada of natural pearl essence which it exports in substantial quantities. It requested an opportunity to present its case for higher rates of duty. However, a request by the Board for a specific proposal respecting rates of duty and for additional information concerning the company's operations went unanswered.

A request for duty-free entry of synthetic pearl essence under both the B.P. and M.F.N. Tariffs was made by Canadian Buttons Limited, of Montreal. The company manufactures polyester buttons, in which the cost of synthetic pearl essence accounts, on the average, for about 25 per cent of the material cost and for between 12½ and 15 per cent of the total factory cost of manufacture.⁽⁴⁾ The company noted that synthetic pearl essence was of a class or kind of product not made in Canada and that "any...tariff imposition on synthetic pearl essence would increase our costs on one of the major ingredients used in our manufacture of goods which are in direct competition with imported goods from low cost countries such as Japan and Hong Kong."⁽⁵⁾

In its submission on behalf of The Mearl Corporation, Canadian Bronze Powder Works proposed that pearl essence be accorded duty-free entry under the British Preferential and Most-Favoured-Nation Tariffs, irrespective of whether it is natural or synthetic and irrespective of the use for which it is destined. The company proposed that this be done by means of an extract from B.T.N. heading 32.09. The principal effect of this proposal would be the removal of duties on any pearl essence now imported under tariff item 247 or 248. However, as noted earlier, known imports under all items are valued at about \$30,000 and most imports are free of duty under item 247b (for imitation pearls) and item 921 (for plastics).

In support of its proposal, Canadian Bronze Powder Works noted that pearl essence was not obtainable from Canadian manufacturers and that some 85 per cent of the cost of raw materials used by The Mearl Corporation in the manufacture of natural pearl essence in the

(1) Transcript, Vol. 99, p. 15037

(2) Same, Vol. 99, p. 15030, 15068

(3) Same, Vol. 99, p. 15030

(4) Same, Vol. 99, p. 15065-6

(5) Same, Vol. 99, p. 15053-4

United States was attributable to materials of Canadian origin. Additional information requested by the Board and filed subsequent to the hearing showed that in 1961 the total value of fish scales, fish, and freight paid by The Mearl Corporation to Canadian boatmen was several times the value of the total Canadian market for pearl essence of all types and for all uses.

Natural pearl essence imported for use in the manufacture of imitation pearls is at present entitled to duty-free entry from B.P. and M.F.N. countries under tariff item 247b. Natural pearl essence for use in the manufacture of plastic products may be entered duty-free under tariff item 921; entry under item 921, is restricted to products of a kind not produced in Canada. When imported for use in the manufacture of lipstick or nail varnish, the product is entered under item 248⁽¹⁾ at 75 cents a gallon, B.P. and 85 cents a gallon, M.F.N. The prices of natural pearl essence were said to range from \$15 to more than \$35 a pound. Even if the commercial product weighed only half as much as water, the cost would be \$75 to \$175 per gallon. At \$75 a gallon, the specific rates under item 248 would be equivalent to only about one per cent, equivalent to duty-free entry. The product may also be entered under item 247, at $17\frac{1}{2}$ p.c., B.P. and 20 p.c., M.F.N., if it does not contain alcohol. The synthetic products are entered under the same items as the natural pearl essence.

As was indicated earlier, all of the proposals placed before the Board urged free entry, under all Tariffs, for both the natural and synthetic pearl essence; these are effectively the rates at which imports are now entered. There was no opposition to these proposals.

(1) Transcript, Vol. 99, p. 15039

ARTISTS', STUDENTS' AND SIGNBOARD PAINTERS' COLOURS, MODIFYING TINTS, AMUSEMENT COLOURS AND THE LIKE, IN TABLETS, TUBES, JARS, BOTTLES, PANS OR IN SIMILAR FORMS OR PACKINGS, INCLUDING SUCH COLOURS IN SETS OR OUTFITS, WITH OR WITHOUT BRUSHES, PALETTES OR OTHER ACCESSORIES - B.T.N. 32.10

The Explanatory Notes to the Brussels Nomenclature comments as follows regarding heading 32.10.

"This heading covers prepared colours and paints of a kind used by artists, students and signboard painters, modifying tints, amusement colours and the like (water colours, gouache colours, oil paints, etc.), provided they are in the form of tablets or put up in tubes, small jars or bottles, pans or in similar forms or packings, including those sold in sets or outfits, with or without brushes, palettes, palette knives, stumps, pans, etc. It does not include printing inks (or colours), Indian ink, whether liquid or solid, or other products classified under heading 32.13, nor crayons, pastels and similar articles (heading 98.05)."

There are understood to be about half a dozen manufacturers in Canada of the products under consideration. However, only one, L.A. Reeves Ink Company Limited, of Toronto, is apparently engaged in their manufacture on a significant scale. The firm makes colours in liquid and dry powder form, which it offers for sale in jars and tins ranging in size from one to 128 ounces. At the time of the public hearing, in October 1962, these products accounted for about 30 per cent of the company's total sales;⁽¹⁾ this ratio has increased somewhat since. L.A. Reeves Ink Company does not manufacture oil colours, nor does it package the water colours in fitted boxes.

The spokesman for L.A. Reeves Ink Company stated that other Canadian manufacturers produce the colours in relatively small quantities, only as a sideline to other operations, an opinion that seemed to be corroborated by the Board in subsequent contact with all five reported potential manufacturers of these products.

At the public hearing, L.A. Reeves estimated that imports supplied between 75 and 80 per cent of the Canadian market for the goods classified in tariff item 247a(1); this item corresponds, generally with heading 32.10. Some of the outfits classified in B.T.N. heading 32.10 may be entered under tariff item 711. In the past five years, imports under item 247a(1) have been relatively stable at an average of approximately \$1.1 million per year. Information acquired by the Board, subsequent to the hearing, suggests that imports probably supplied an even higher percentage of Canadian use of the products classified in item 247a(1). About 43 per cent of all imports were from the U.K.

(1) Transcript, Vol. 100, p. 15102

Imports under item 247a(1) consist of two main types of goods; colours in various forms and packings, and fitted boxes and similar sets. The latter are not made in Canada.

Artists' and school children's colours and fitted boxes containing them are at present specifically provided for in tariff item 247a(1), duty-free under the British Preferential Tariff and dutiable at 15 p.c. under the Most-Favoured-Nation Tariff. This item was not initially referred to the Board but was later included because the Board considered it relevant to the inquiry.

Tariff item 247a(1) has been interpreted to apply to colours of the type used by artists and school children generally, including those used by sign-board painters and for general amusement purposes. Fitted boxes containing such colours are allowed entry under this item even when they contain other accessories, such as brushes, palettes, palette knives, thinners or oil. Thus, there appears to be very close correspondence between products classified under item 247a(1) and those of heading 32.10.

In its submission to the Board, L.A. Reeves Ink Company Limited proposed that artists' and school children's colours be dutiable at rates of 15 p.c., B.P. and 20 p.c., M.F.N. Elaborating on the proposed rates, a representative of the company noted that his firm was concerned chiefly with imports from the United Kingdom, now entered duty-free.⁽¹⁾ The existing most-favoured-nation duty of 15 p.c. was said to offer adequate protection on imports from the United States and the increase to 20 p.c. proposed by the company was said to be designed chiefly to maintain a differential between the two Tariffs.

In support of its request for a duty of 15 p.c. under the British Preferential Tariff the company stated:

"We are paying an average duty of 15 per cent on our raw materials whereas our competitors are importing the finished product duty free.

"We ask for the same protection on our finished products as we must pay for our raw materials."⁽²⁾

A spokesman for the company said that raw materials represent a little over 50 per cent of the cost of production; he also indicated that, in terms of value, almost all of the principal raw materials were obtained in Canada. The company said it imported two types of organic dry pigments but these accounted for a negligible percentage of total cost.

From figures cited earlier, it is evident that only about 40 per cent of the colours imported under tariff item 247a(1) are entered under the British Preferential Tariff, all from the United Kingdom. A considerable portion of the imports from the United Kingdom appears to consist of oil colours and fitted boxes which, as far as is known, are not manufactured in Canada at present.

(1) Transcript, Vol. 99, p. 15081-2
 (2) Same Vol. 99, p. 15077

Another company, Reeves & Sons (Canada) Limited, of Toronto, requested that no change be made in the existing provisions of tariff item 247a(1). The firm imports colours and fitted boxes under this item, mostly from its parent company in the United Kingdom, for distribution in Canada. The company supported its position on the following grounds:

"We submit that with the exception of a limited range, the goods classifiable under tariff item 247a(1) are not, in fact, produced in Canada and that any upward revision in existing tariffs would only elevate the prices at which such products could be made available in this country. Since educational departments are the single chief user, they would have to carry much of the additional burden."⁽¹⁾

Available evidence confirms that Canadian production of the types of colours used by artists, school children and students is at present confined mostly to water colours and that for other types Canadian users must rely on imports.

It was suggested during the public hearing that the term "modifying tints", used in heading 32.10, described preparations which are added to finished paints or colours in order to achieve small adjustments in shade or hue; they were said to be similar, if not identical, with the tinting pastes used in the manufacture of paints.⁽²⁾ The Board has been informed that such preparations would be entered under item 247a(1) if they were intended to be applied directly to paper, canvas or other such surface. However, if they were intended to be mixed with paints they would probably be entered under such items as 246, 247 or 220a(1). If for mixing with paints, some would probably be classified in heading 32.09 of the B.T.N.

Some concern was expressed about the interpretation of the phrase "in similar forms or packings" which occurs in the wording of heading 32.10. At the present time artists' and students' colours imported in bulk are entered under item 247a(1). If heading 32.10 were interpreted to include only small packages, it would exclude such shipments and would be narrower in application than the existing item.

(1) Transcript, Vol. 100, p. 15125

(2) Same Vol. 99, p. 15079-80

PREPARED DRIERS - B.T.N. 32.11

Prepared driers are preparations used to accelerate the drying of certain paints or varnishes. They consist mainly of a chemical drier such as lead borate, zinc naphthenate, zinc oleate, manganese dioxide, or cobalt resinate, either mixed with a filler such as gypsum (solid driers), or in the form of concentrated solutions in turpentine or other organic solvents (liquid and paste driers). The heading excludes separate chemically defined compounds, resinates and boiled and drying oils.

At the time of the public hearing, Nuodex Products of Canada, Limited, of Toronto, and Dussek Brothers Canada Limited, of Belleville, Ontario, were reported to be the only manufacturers of prepared driers for sale in Canada. There was also reported to be one firm engaged in the manufacture of prepared driers for its own use. More than 75 per cent of the Canadian consumption of prepared driers was said to be purchased.

The total value of driers used in the manufacture of paints, varnishes and printing inks was about one million dollars in 1963. Imports are not reported separately in official statistics, but figures available to the Board suggest that they are small, accounting for less than ten per cent of total consumption. These orders of magnitude were corroborated by a spokesman for the two Canadian manufacturers, who also said that most of the imports were from the U.S.A.⁽¹⁾

Liquid driers are entered under tariff item 249 at rates of 15 cents per gallon and 5 p.c., B.P., and 15 cents per gallon and 15 p.c., M.F.N. Paste and solid driers are entered under item 220a(i) at 15 p.c., B.P. and 20 p.c., M.F.N. The available information suggests that most imported driers are entered under item 249. At the time of the public hearing, late in 1962, the ad valorem equivalents of the combined rates under item 249 were approximately 9 p.c., B.P. and 18 p.c., M.F.N.

The two Canadian manufacturers of prepared driers made the following joint representations:

"The description under B.N. 32.11 does not in our opinion adequately describe these products. We propose a description as follows:

B.N. 32.11 - Prepared Driers

Prepared driers are mixtures or compounds used individually or in combinations to accelerate drying of certain paints, varnishes or printing inks by facilitating the oxidation or polymerization of the drying vehicle. These

(1) Transcript, Vol. 100, p. 15184

products may consist of the metal soap of an organic acid, usually in the liquid form, but may also be in paste or solid form. Metals commonly used are lead, cobalt, manganese, calcium, zinc, iron, cerium, lanthanum, zirconium and others reacted with such acids as naphthenic, 2-ethyl hexoic, linseed fatty acids, tall oil fatty acids, tall oil rosin or other organic acids which will produce solutions of these soaps in mineral spirits and other solvents or vegetable oils.

"Since most of the products described above are manufactured by one or the other of the proponents of this brief, we ask that tariff protection be continued, but changed to the following:

B. P. - 20 per cent ad valorem
M.F.N. - 20 per cent ad valorem

"The suggested duty is essentially the same as at present for M.F.N. countries, however, the duty under 249 as applied to B.P. countries is in our opinion inadequate and for this reason we recommend the increase as above."(1)

The proposed change in wording was said to be designed to be a more accurate description of the products and to allow entry under this heading of certain chemical compounds, namely naphthenic acid salts, in undiluted form. Such salts would otherwise be classified under heading 38.19; they are discussed under that heading.

The principal effect of the rate proposals would be to increase the B.P. rate from the equivalent of about 9 p.c., ad valorem, to 20 p.c.; the rate under the M.F.N. Tariff would also be increased but by only a small amount.

A spokesman for the two companies said that British driers had been offered in Canada at landed prices only slightly higher than those of comparable Canadian driers. From this it would appear that the Canadian producers can compete successfully with British manufacturers even with the existing B.P. Tariff, equivalent to about 9 p.c. With no imports from the U.K., the two companies would share an additional annual market of only about \$10,000, at most.

The small share that imports have of the domestic market suggests that the U.S.A. is also not a serious threat to the Canadian producers. A spokesman for the two companies confirmed this in saying that, by and large, prices of these products were lower in Canada than in the U.S.A. (2)

(1) Transcript, Vol. 100, p. 15172-3

(2) Same Vol. 100, p. 15186

GLAZIERS' PUTTY; GRAFTING PUTTY; PAINTERS'
 FILLINGS, AND STOPPING, SEALING AND SIMILAR
 MASTICS, INCLUDING RESIN MASTICS AND CEMENTS
B.T.N. 32.12

The Explanatory Notes to the Brussels Nomenclature contain the following comments on the products classified in heading 32.12:

"The mastics of the present heading are preparations of widely differing compositions which are essentially characterised by the uses to which they are put.

Some (e.g. stopping and sealing mastics) are mainly used to stop, seal or caulk cracks and, in certain cases, to bond or firmly join components together. They are distinguished from glues and other adhesives by the fact that they are applied in thick coatings or layers.

Others (e.g. painters' fillings) are used to level out surface irregularities or to facilitate the subsequent application of paints or varnishes. They are distinguished from paints, varnishes and similar products by their high content of fillers and, where appropriate, of pigments; this content is generally much higher than the content of binders and solvents, or of dispersing liquid.

These preparations are usually put up in a more or less pasty form and in general they harden after use. Some are, however, put up in solid or powder forms. These are made pasty at the time of use by heating (e.g. by melting) or by addition of a liquid (e.g. water).

These preparations are usually applied with a palette knife.

The present heading covers in particular:

- (1) Mastics based on oil. These are composed essentially of drying oils, fillers (whether they react with the oils or are inert) and hardeners.. The best known product of this type is glaziers' putty.
- (2) Mastics based on sodium silicate. These are generally put up in pasty form, and consist of an aqueous solution of sodium silicate and potassium sodium silicate, with added fillers (e.g. quartz powder, sand, asbestos

fibres, etc.) and setting accelerators. They are mainly used to seal sparking plugs, engine blocks and sumps, radiators, etc., and to fill or stop certain joints.

- (3) Mastics based on zinc oxychloride. These are obtained from zinc oxide and zinc chloride to which retarding agents and, in certain cases, fillers are added. They are used for filling holes and cracks in wood, ceramics, etc.
- (4) Mastics based on magnesium oxychloride. These are obtained from magnesium chloride and magnesium oxide, to which fillers (e.g. wood flour) are added. They are mainly used to stop or seal cracks in wooden articles ("plastic wood").
- (5) Mastics based on sulphur. These are composed of sulphur mixed with inert fillers. They are put up as solids. They are used to produce hard, waterproof, acid-resistant stoppings, and also to bond or fix pieces in place.
- (6) Mastics based on plaster. These are put up as fibrous and flocculent powders, composed of a mixture of about 50% plaster with other materials such as asbestos fibres, wood cellulose, glass fibres, sand, etc. They are made pasty by the addition of water, and used to secure screws, gudgeon pins, cotters, hooks, etc.
- (7) Mastics, fillers, etc., based on artificial plastic materials, with a high added proportion (up to 80%) of various fillers (e.g. clay, sand and other silicates, titanium dioxide, metallic powders). Some are used after the addition of hardeners. They are principally used to seal certain joints (watertight, etc., joints); as coatings for facades; to level flooring; as mastics and coatings for coachwork, bodywork of cars, etc; for the repair of metal objects or to bond them to other substances.
- (8) Mastics based on zinc oxide and glycerol. These are employed to produce acid-resistant coatings, to bond iron parts to porcelain ware, and for joining tubes.

- (9) Mastics based on rubber. These may be composed, for example, of a thioplast with the addition of fillers (graphite, silicates, carbonates, etc.) and, in certain cases, of an organic solvent. They are used, after the addition of a hardener, to give flexible protective coatings (resistant to chemical agents and to solvents), and also for caulking.
- (10) Mastics based on wax (luting wax). These consist of waxes (of all kinds) to which resins, shellac, rubber, resin esters, etc., are often added to increase the adhesive effect. The heading also includes mastics in which the wax is wholly or partly replaced by products such as cetyl alcohol or stearic alcohol. These products include grafting putties and sealants for coating barrels, casks, etc.
- (11) Resin mastics and cements. These consist of natural resins (shellac, damar, rosin) or artificial resins (alkyd resins, coumarone resins), intermixed and usually with the addition of other materials (e.g., waxes, oils, bitumens, rubber, brick powder, lime, cement or any other mineral fillers). It should be noted that certain of these mastics are also covered by the types described above (e.g., those based on artificial plastic materials or on rubber). The mastics and cements of this group serve many purposes, for example: - as fillers in the electro-technical industry; for sealing glass, metal or porcelain objects. They are generally applied after they have been made fluid by melting.

This group also includes sealing waxes. These consist essentially of a mixture of resinous materials (e.g., shellac, rosin), together with a (usually high) proportion of fillers and colouring matter. They are used to fill holes, for the watertight sealing of glass apparatus, for sealing documents, etc.

But the present heading excludes sealing waxes which, by reason of their composition or the way in which they are put up, are proper to heading 34.04 or 98.09 as the case may be.

In the case of certain of the products described above, the intermixture of the various constituents, or the addition of certain constituents, must be carried out at the time of use. Such products remain classified in the present heading provided that the constituents are:

- (i) Put up together in packages or wrappings of the type which are, as such, intended for retail sale.
- and (ii) Identifiable, whether by their nature or by the relative proportions in which they are present, as being complementary one to another.

However, in the case of products to which a hardening agent must be added at the time of use, the absence of this agent does not exclude the products from the present heading provided that their composition or the method in which they are put up identifies them as being for use as mastics, fillers, etc.

The present heading excludes:

- (a) Natural resins known in certain languages as "mastics" (heading 13.02).
- (b) Plasters, lime and cements covered by heading 25.20, 25.22 or 25.23.
- (c) Mastics of asphalt and other bituminous mastics (heading 27.16).
- (d) Dental cements and other dental fillings (heading 30.05).
- (e) Brewers' pitch, foundry core binders, etc. of heading 38.10.
- (f) Refractory cements and mortars of heading 38.19."

It is obvious from the foregoing that a wide variety of preparations are included in heading 32.12. They are distinguished mainly by their use in sealing, filling and levelling and may be manufactured from natural materials such as wood or minerals, from synthetic materials of all kinds, or from mixtures of materials. The preparations of heading 32.12 may be produced in a number of industries although, in terms of value, most are likely to be manufactured by companies associated with the paint and varnish industry or manufacturers of chemicals and related products.

The available statistics for products of heading 32.12 are incomplete. However, it is known that Canada produced various caulking materials, putty, sealing compounds and fillers in 1961, valued at \$3.7 million. It is estimated that output of these preparations, in 1964, was valued at approximately \$5 million. Imports

of this kind of product were valued at \$2.4 million in 1964; exports appear to be negligible. Thus, it appears that Canadian use of these products would be valued at approximately \$7.5 million and probably more.

Shipments of Putty, Caulking and Sealing Compounds,
1959-63

<u>Shipments</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
Caulking Materials	1,129	1,067	1,021	..	..
Putty	1,468	1,676	1,823	2,088	2,328
Sealing Compound	..	..	861	..	..
Filler for Floors	<u>174</u>	<u>165</u>	<u>121</u>	<u>237</u>	<u>211</u>
Total of above	2,771	2,908	3,826	2,325	2,539

Source: D.B.S., Cat. Nos. 31-201, 31-211, 46-210

Relatively complete statistics are available only for putty. They indicate a market in Canada of about \$2.5 million. Imports appear to be about \$165,000, annually, about seven per cent of domestic use. Exports are negligible.

Canadian Shipments, Imports and Consumption of Putty,
1958-63

	<u>Shipments</u>	<u>Imports</u> - \$'000 -	<u>Canadian</u> <u>Use (a)</u>
1958	1,621	162	1,783
1959	1,468	165	1,633
1960	1,676	142	1,818
1961	1,823	165	1,988
1962	2,088	165(b)	2,253
1963	2,328	165(b)	2,493

(a) Shipments plus imports

(b) Carried forward at 1961 level

Source: D.B.S., Cat. No. 46-210 and Trade of Canada, Imports

Imports of putty are almost entirely from the U.S.A. It is noteworthy that the average value of imports is from 40 to 95 per cent higher than the average value of shipments by Canadian manufacturers, suggesting that they are different types than the domestic products; it also suggests that they probably are not, therefore, directly competitive with Canadian production.

Tariff Considerations

The preparations classified in heading 32.12 may be entered under the following tariff items:

<u>Item</u>	<u>Brief Description</u>	<u>B.P.</u>	<u>M.F.N.</u>
220a(i)	Chemical preparations of more than one substance, dry	15 p.c.	20 p.c.
224	Sealing wax	15 p.c.	22 $\frac{1}{2}$ p.c.
246	Oxides...fillers...colours dry, n.o.p.	12 $\frac{1}{2}$ p.c.	17 $\frac{1}{2}$ p.c.
247	Liquid fillers...liquid paints, n.o.p.	17 $\frac{1}{2}$ p.c.	20 p.c.
253	Putty of all kinds	17 $\frac{1}{2}$ p.c.	22 $\frac{1}{2}$ p.c.
618	Rubber cement...all manufacturers of rubber, n.o.p.	15 p.c.	20 p.c.
711	All goods, n.o.p.	15 p.c.	20 p.c.
904	Synthetic resin compositions, n.o.p.	15 p.c.	15 p.c.

Items 224 and 618 are outside the terms of Reference 120.

Information on imports by tariff item permits some estimation to be made of the percentage distribution of the imports by tariff item, as follows:

Imports of Products of Heading 32.12, in 1964

<u>Tariff Item Under Which Entered</u>	<u>Per Cent of Imports of Heading 32.12 to Which Item Applied</u>
220a(i)	53
224	1
246	12
247	7
253	4
618	*
711	16
904	<u>7</u>
	100

The only representations made regarding the products of heading 32.12 were by one Canadian manufacturer and the Industry Committee. Other representations were made to the Board with respect to some of the tariff items mentioned above. In so far as these representations apply to somewhat similar products as those dealt with here, they have some relevance to these considerations and are mentioned below.

The only company representation at the hearing on heading 32.12 was by the Minnesota Mining and Manufacturing Company Limited, of London, Ontario, a manufacturer of sealants. The company requested rates of 15 p.c., B.P. and 20 p.c. M.F.N. on sealants manufactured from polysulphide. Such sealants are before the Board in Reference 120 only to the extent that they are now classified under tariff item 904; on these, the proposal would result in an increase of 5 percentage points under the Most-Favoured-Nation Tariff, with no change in the British preferential rate. Some of the polysulphide sealants may also be classified under item 618, which is not part of Reference 120.

The company spokesman estimated the total Canadian market for polysulphide sealants of the type it manufactures to be about \$750,000 annually, of which about \$100,000 was said to be supplied by imports from the U.S.A. Imports were said to be for use by the aircraft industry; for this purpose they would qualify for a drawback of duty of 99 p.c. under drawback item 1071 which is outside the terms of the current Reference. Information obtained by the Board subsequent to the hearing suggests that prices of polysulphide sealants, for use in other applications, tend to be somewhat lower in Canada than in the United States; this was attributed to the intense competition prevailing among manufacturers in Canada.

The Board was informed that there has been no competition in this production from the United Kingdom; firms in that country were reported to be making polysulphide sealants under licence from companies in the U.S.A., for use primarily in the United Kingdom and Europe.

The Industry Committee urged the adoption of B.T.N. heading 32.12 and rates of 15 p.c., B.P. and 20 p.c., M.F.N. for the products classified under it. The Committee singled out caulking compounds, wood fillers and glaziers' putty as the products that are commercially significant. The Committee did not receive rate recommendations from Canadian manufacturers; the spokesman for the Committee suggested that the companies which make these products were not sufficiently concerned with them to appear before the Board.⁽¹⁾

It should be noted that B.T.N. heading 32.12 is intended to cover certain types of sealants now entered under tariff items 224 and 618 which are not before the Board in this Reference.

(1) Transcript, Vol. 100, p. 15202

WRITING INK, PRINTING INK AND OTHER INKS - B.T.N. 32.13

Heading 32.13 includes all types of inks - those used for printing, writing, drawing, copying and marking. It includes these products when concentrated or solid, for example, in the form of powders or sticks which can be easily diluted or dispersed. It also includes simple reservoirs containing ink for fountain pens. Special inks, such as copying and hectographic inks, inks for ball point pens, for duplicating machines, for typewriter ribbons and others, are all included in heading 32.13. However, the heading excludes refills for ball point pens which consist of the ball point and ink reservoir.

In general, printing inks are manufactured by companies for which that is their major activity, but most of the writing ink is produced by companies for which it is a minor part of the operation. Because of this difference and because printing and writing inks are produced differently and are sold to different kinds of consumers, the discussions of printing and writing inks are separated in the following.

Printing InksThe Products

The Explanatory Notes to the Brussels Nomenclature describe printing inks in the following terms:

"Printing inks (or colours) are pastes of varying consistency obtained by mixing a very finely divided black or coloured pigment with a vehicle, such as a mixture of stand oil with rosin, coumarone resin, etc., or a mixture of refined mineral oil with rosin, bitumen, stearin pitch, artificial resins, etc. The pigment is usually carbon black for black printing inks and an organic colour for coloured inks."

Certain minor additives may also be used to enhance such properties as drying, adhesion, viscosity and resistance to abrasion; the more important of these additives are dryers, gums, starches and surface active agents.

Printing inks are formulated according to stringent specifications related to the method of printing and the nature and intended use of the material on which the printing is done. Printing inks are usually classified according to the printing process in which they are to be used. The principal categories of printing inks are given below.

1. Letterpress and newsprint inks; these are designed for printing from raised surfaces. They are usually of moderate tack and viscosity. Newsprint inks are priced between 5 cents and 15 cents a pound; letterpress inks range from 50 cents to \$4.00 a pound, depending on the colour and the quality.

2. Lithographic or off-set inks are designed to print from flat surfaces. They are more viscous and have a higher pigment content than letterpress inks and are the most expensive of all printing inks, ranging in price from about \$1.00 to \$5.00 or more, a pound.
3. Rotogravure, also known as intaglio or gravure inks, are designed to be used in conjunction with etched or engraved printing plates or cylinders. One of their major characteristics is their ability to dry quickly. They are relatively inexpensive, varying in price mostly between ten cents and one dollar a pound.

Apart from certain basic characteristics noted in the above descriptions, the composition of the inks within each general category may vary widely; this accounts to a large extent for the wide range of prices within each category. Because printing inks seldom exceed three per cent of the total cost of printing, the choice between the various types of inks is determined mostly by the printing process in which they are used.

It should be noted that printing inks used for the decoration of textiles are also classified in heading 32.13. They are similar to the typographic inks referred to above, but are specially designed for printing on fabrics.

Manufacturing Processes

The manufacture of printing inks is a relatively simple process and is similar in many ways to the manufacture of surface coatings described earlier in this volume. In a number of successive operations, the colouring agent, vehicle and the other additives are mixed, ground and adjusted to yield a finished product possessing the desired colour, consistency and other characteristics. Much of the equipment, including the mixers and roller or ball mills, is similar to that used in making paints. However, for some types of inks, such as certain letterpress and rotogravure inks, specially designed grinding systems are sometimes used. The various types of mixing and grinding machines usually range in price from about \$7,000 to as much as \$20,000.

Printing inks, like decorative and protective coatings, are manufactured in batches. However, the size of each batch is usually smaller, some production batches being as small as five pounds, or even less. A large proportion of printing inks is said to be made to order; one manufacturer reported that not more than five per cent of his sales were supplied from stock.

The Industry

In 1964, there were 37 plants in Canada engaged principally in the manufacture of printing inks. Their combined shipments of inks during that year were valued at more than \$20 million. In addition, they produced products such as print rollers, mucilage and paste, carbon paper, typewriter ribbons and other products whose value, at plant, has been declining and was \$804,000 in 1964. The 37 plants

accounted for practically all of the printing inks manufactured in Canada; small quantities were also produced in plants classified in other industries. Most of the plants which manufacture printing inks are located in Montreal, Toronto, Winnipeg and Vancouver, the principal Canadian publishing and printing centres.

The Printing Inks Industry, Principal Statistics, 1958-64

	<u>Plants</u>	<u>Production</u>	<u>Production</u>	<u>Cost of</u>	<u>Value of</u>	<u>Value</u>
	<u>no.</u>	<u>Employees</u>	<u>Wages</u>	<u>Materials</u>	<u>Shipments</u>	<u>Added</u> (a)
	no.	no.	\$'000	\$'000	\$'000	\$'000
1958	28	582	2,078	6,749	15,557	8,686
1959	31	612	2,332	7,710	17,676	9,817
1960	31	614	2,465	7,608	17,671	10,037
1961	32	630	2,674	8,362	19,038	10,571
1962	34	662	2,753	8,613	20,056	11,535
1963	35	674	2,874	8,981	20,377	11,353
1964	37	691	3,164	10,009	20,959	10,979
1965	38	..	..	10,972	24,397	13,171(b)

(a) By manufacturing activity

(b) Partly estimated

Source: D.B.S., Cat. No. 46-208, 46-216; trade publications

In the five years, 1959-64, sales of all goods by the industry increased by nearly 20 per cent and the value added by manufacturing by approximately 12 per cent. During this period, the number of employees rose by about 13 per cent and the net output (value added) per production employee remained about the same, at around \$16,000. The value added per employee in the inks industry is much lower than in the paint and varnish industry.

The cost of materials used by the industry in recent years has generally been about 43 to 45 per cent of the value of factory shipments, about the same as in the chemical industry generally. Information obtained by the Board indicates that, on average, purchased materials account for about 60 per cent of the total factory cost of manufacturing printing inks in Canada. In terms of cost, various colouring agents are by far the most important materials used, accounting for about 40 per cent of the cost of all materials used. The other principal materials, in approximate order of importance, are varnishes, gums, resins, oils and solvents.

According to a survey conducted by the Canadian Printing Ink Manufacturers' Association, about 80 per cent of the materials used by the industry are of Canadian origin.⁽¹⁾ A spokesman for the Assoc-

(1) Transcript, Vol. 100, p. 15233; Vol. 101, p. 15312

iation also indicated that pigments were the most important single category of imported materials;(1) most of these apparently originate in the U.S.A. The spokesman also noted that varnishes used in the manufacture of printing inks were dutiable at 20 p.c., M.F.N., under tariff item 220a(i). Additional information indicated that some companies procured only about 50 per cent of their pigments, oils and varnishes, in Canada and others as much as 90 per cent. From this it is evident that the extent of the reliance on imported pigments and varnishes varies considerably from one firm to another, but that there are firms able to procure the bulk of their requirements of these basic materials in Canada.

The Market

The Canadian market for printing inks has been increasing almost without interruption, from about \$12 million in 1953 to more than \$24 million in 1964. Throughout this period Canadian manufacturers have supplied about 90 per cent of the total market. Imports, which were valued at about one million dollars in 1953 were valued at \$2.1 million in 1964; they have been mostly from the U.S.A.

The Canadian Market for Printing Inks, Selected Years, 1957-64

<u>Year</u>	<u>Shipments</u>	<u>Imports</u> - \$'000 -	<u>Exports</u>	<u>Apparent Market in Canada</u>
1957	14,810	1,445	34	16,221
1959	16,001	1,684	47	17,638
1961	17,698	2,173	19(a)	19,852
1963	20,322	2,036	45(b)	22,313
1964	22,034	2,127	45(a)	24,116

(a) U.S.A. only; U.S. data

(b) Estimated

Source: D.B.S., various publications; U.S. Imports for Consumption

In terms of the quantities used, the use of newspaper ink is about as large as all others combined. However, as noted earlier, newspaper ink is relatively low-priced and as a result accounts for only 10 to 13 per cent of the value of Canadian shipments of all printing inks. Letterpress inks, which range from 50 cents to \$4.00 a pound, account for about 40 per cent of the value of shipments. The data which follow indicate the relationships between the major kinds of inks.

(1) Transcript, Vol. 101, p. 15323

Shipments by Printing Inks Industry, by
Principal Type, 1953 and 1963

Type of Ink	1953			1963		
	'000 lb.	\$'000	\$/lb.	'000 lb.	\$'000	\$/lb.
Newsprint	14,078	1,419	.10	17,374	2,261	.13
Letterpress	5,323	5,282	.99	7,721	7,298	.95
Lithographic	1,541	1,865	1.21	3,561	5,694	1.60
Other ^(a)	<u>4,793</u>	<u>2,560</u>	<u>.53</u>	<u>8,710</u>	<u>4,379</u>	<u>.50</u>
Total	25,735	11,126	.43	37,366	19,632	.53

(a) Includes rotogravure, flexographic, silk screen, duplicating, stamping and other specialized inks

Source: Based on D.B.S., Cat. No. 46-208 and 46-216

It is evident from the table that the largest absolute growth in value of shipments has occurred in lithographic and letterpress inks. In the years for which detailed data are available, 1953-63, the value of sales of lithographic ink has trebled and of letterpress ink has increased by about 40 per cent. It is also evident that lithographic inks are by far the most costly, on average, and have become relatively more costly in recent years.

A large proportion of the printing inks, particularly those for printing labels or packages, are produced to individual specifications; these vary widely and result in large numbers of relatively small orders. Thus, while an occasional order may involve one million pounds of product, far more frequently orders are for small lots of as little as one pound; the average size of shipment was said to be only about ten pounds.⁽¹⁾

The provision of technical consulting services to the users of printing inks and the ability to effect quick deliveries are important features of the industry. The ability to provide these services places a premium on proximity to the market and the maintenance of a close relationship between the printing ink manufacturer and his customers. In general, Canadian producers benefit from this because they are located in the same cities as the major printing plants and are in a position to offer consultative, delivery and other services on short notice.

Imports of printing inks have increased with the growth of the Canadian market, but they continue to supply about the same proportion of Canadian requirement as they did a decade ago. Imports in the mid-1950's were about \$1.1 million annually and supplied 8.8 per cent of Canadian demand; in 1963 and 1964 imports averaged \$2.1 million annually and were 9.1 per cent of sales in Canada. Increased imports of printing inks other than rotogravure inks account for most of the increase.

(1) Transcript, Vol. 100, p. 15231; Vol. 101, p. 15307

Inks used for printing designs on textiles are included in the tabulation that follows. It is estimated that in 1964 imports of textile printing inks were valued at \$146,000.

Imports of Printing Inks, Selected Years, 1953-64

	<u>Rotogravure Ink(a)</u>	<u>Other Printing Inks</u>			<u>Total Printing Inks</u>
		<u>U.K.</u>	<u>U.S.A.</u>	<u>Total</u>	
		- thousand dollars -			
1953	87	156	828	986	1,073
1956	271	191	787	1,006	1,277
1959	429	315	853	1,255	1,684
1962	520	372	1,184	1,719	2,239
1963	478	402	1,020	1,558	2,036
1964	428	377	1,212	1,699	2,127

(a) All from the U.S.A. except for \$2,000 imports from W. Germany in 1964

Source: D.B.S., Trade of Canada, Imports

All imports of rotogravure inks and most imports of other printing inks are from the U.S.A.; Britain and West Germany are the other sources of supply of printing inks. At the public hearing it was said that Canadian manufacturers of printing inks account for some of the imports. Their foreign purchases consist principally of bases destined for further processing; a smaller portion is in the form of finished inks of a type which it is not economical to manufacture in Canada.⁽¹⁾

A comparison of list prices in Canada and the U.S.A. suggests that prices of Canadian printing inks were substantially higher than those in the U.S.A. However, information obtained from Canadian users of printing inks indicated that prices actually charged by Canadian manufacturers were generally comparable with prices charged by U.S.A. suppliers. The fact that imports are usually only about ten per cent of Canadian requirements tends to support such a conclusion.

Writing Inks

Writing inks are essentially solutions or suspensions of colouring material in water; they usually also contain certain other ingredients designed chiefly to facilitate their application or to impart varying degrees of permanence. The Explanatory Notes to the Brussels Nomenclature comment on writing inks as follows.

"Ordinary writing and drawing inks are solutions or suspensions of a black or coloured material in water,

⁽¹⁾ Transcript, Vol. 101, p. 15321

usually with the addition of gum and other products (e.g., preservatives). These include inks based on iron salts, inks based on logwood extracts or on synthetic organic colours. Indian ink, used mainly for drawing, consists usually of lamp black in suspension in water (with the addition of gum arabic, shellac, etc.), or in certain animal glues."

Depending on their composition, writing inks are usually grouped into three principal categories, namely permanent writing inks, washable writing inks and drawing inks. In permanent writing inks, the basic black or blue-black colour is obtained mostly by the chemical reaction of an iron salt with tannic acid; a dye may be added to intensify the colour. In washable writing inks, soluble black or coloured dyes are used to impart the desired colour. Drawing inks, such as India ink, rely chiefly on lamp black or carbon black for their colour, while coloured drawing inks employ pigments mostly of mineral origin.

The manufacture of writing inks consists chiefly of purifying water by distillation or deionization, dissolving or mixing the ingredients, clarifying the resulting solution by decanting, filtering or centrifuging, and packaging.

At present there are about ten firms in Canada engaged in the manufacture of writing inks. However, most of the output originates with four large firms, including the Carter's Ink Company of Canada, Limited, Parker Pen Company Limited, W.A. Sheaffer Pen Company of Canada, Limited and L.E. Waterman Pen Company, Limited. All of these firms also manufacture other products, including fountain and ball point pens, pencils, and a variety of office supplies such as typewriter ribbons, carbon paper and stamp pads. For most of these companies the manufacture of writing inks is a minor activity.

Details of the apparent Canadian market for writing inks are given in the following table.

Apparent Canadian Market for Writing Inks,
Selected Years, 1954 to 1964

	Canadian Shipments	Imports				Canadian Market
		U.K.	U.S.A.	Total	Exports	
		- Thousand Dollars -				
1954	516	3	71	84	..	600
1957	489	5	119	130	12	607
1959	555	2	114	157	8	704
1961	650	4	150	199	*	849
1963	600	6	111	159	..	759
1964	482	40(a)	158(a)	249(a)	..	731

(a) In 1964 includes special writing inks

Source: Based on D.B.S., Cat. Nos. 46-208, 46-216 and 65-007

The Canadian market for writing inks increased fairly steadily until 1962 and then declined in 1963 and 1964. Imports have increased more rapidly than sales in Canada, with the result that the market supplied by Canadian manufacturers has declined from 86 per cent in 1954 to an estimated 66 per cent in 1964. About 75 per cent of imports during this period were from the U.S.A.

Tariff Considerations

The printing and other inks which are classified under heading 32.13 are entered under tariff items 203d, 256, 256a and 257. The relevant items are reproduced below together with the estimated imports under each in 1964.

<u>Item and Description</u>	<u>Rates of Duty</u>		<u>1964 Imports</u>	
	<u>B.P.</u>	<u>M.F.N.</u>	<u>B.P.</u>	<u>M.F.N.</u>
			\$'000	
203d Pigments and inks for use in the colouring or print- ing of textiles	Free	Free	2	144
256 Printing inks	12½ p.c.	15 p.c.	410	1,260
256a Rotogravure	12½ p.c.	17½ p.c.	-	428
257 Writing ink	15 p.c.	20 p.c.	5	127

The imports known to have been entered under item 256 consist mainly of ordinary printing inks but include some special types such as duplicating, ball point, stamp pad and similar products.

The Canadian Printing Ink Manufacturers' Association, whose members were reported to have accounted for over 80 per cent of all printing inks sold in Canada in 1960, proposed:

"That a new item reading as follows be introduced in the Customs Tariff to replace items 256 and 256(a).

"Printing ink, a liquid or viscous composition designed for printing surfaces, requiring no functional modification for the printing process for which intended with rates of duty 15 per cent B.P. 20 per cent M.F.N. and 25 per cent General."(1)

As an alternative to the above wording, they submitted the following, with no change in the rates proposed.

"Printing Ink - a substance suitable for transference to any surface by any of the various printing processes, in liquid, paste or solid form obtained by dispersing or mixing pigment and/or dye, with required additives, in a vehicle."(2)

(1) Transcript, Vol. 100, p. 15228

(2) Same, Vol. 101, p. 15259

The proposed deletion of the two existing items (256 and 256a) was said to be based on the grounds that there was no basic difference between rotogravure inks and other printing inks, and that all printing inks should be dutiable under the same item.⁽¹⁾ In addition, the spokesman for the Association indicated that the wording was designed to exclude from the coverage of the proposed item certain products, in particular flushed colours, which he claimed were at present allowed entry as printing inks under tariff item 256.⁽²⁾ The Board understands that flushed colours may, indeed, have been allowed entry under existing item 256; they are classified under heading 32.09 of the B.T.N.

The second revision of the wording was intended to ensure that inks in solid form, irrespective of whether they are based on pigments or dyes, would be allowed entry under the proposed item. All such inks are classified under the existing provisions pertaining to inks and heading 32.13 and the need for the proposed wording is therefore not clear.

The Association contended that the proposed item would have the same coverage as existing items 256 and 256a, together. This would appear to be so, except for the possibility that flushed colours and inks for ball point pens would be excluded. The latter are at present allowed entry under item 256, on the grounds that they are more like the printing inks of that item than to the writing inks provided for in tariff item 257.

The proposal of the Canadian Printing Ink Manufacturers' Association would result in an increase of $2\frac{1}{2}$ and 5 percentage points under the British Preferential and the Most-Favoured-Nation Tariffs, respectively, on the printing inks now entered under tariff item 256, and an increase of $2\frac{1}{2}$ percentage points under both the B.P. and M.F.N. Tariffs on the rotogravure inks now entered under item 256a; as noted earlier, most of the imports are entered under item 256 and originate in the U.S.A.

In support of the request for higher levels of protection, the spokesman for the Association said:

"In the...production of ink Canadian plants, were and still are unable to compete cost wise with the plants of the U.S.A. and the U.K. which benefit from the cost savings of a much larger volume of production - and in the U.K. from lower wage levels as well. Printing ink is a vital product to its users but one which seldom exceeds three per cent of the cost of any printing job. This means in Canada that we are faced with a multitude of small orders. A survey of a few years ago indicated the average shipment was approximately 10 lbs. in weight. This fact also helped to establish the industry in Canada. The industry obtains practically all of this type of business - but still loses out to imports on large and repeating orders for printing inks....

(1) Transcript, Vol. 101, p. 15279, 15281

(2) Same Vol. 100, p. 15248-9

"To produce inks to fill these small orders and to supply the much needed service in an efficient manner and at a reasonable price, it is essential that volume business - large orders - can also be obtained. It is in this field that tariff protection is required."(1)

Elaborating on the disadvantages which Canadian manufacturers of printing inks face in relation to those in the United States, a spokesman for the Association stated:

"We are penalized to start off with by having to pay a higher rate of duty on the raw material than on the finished ink; and on top of that we are penalized by having to charge a higher conversion rate to the manufacturer of the ink in Canada due to the fact that we are manufacturing in smaller quantity."(2)

There is no doubt that manufacturers of printing inks in the United States enjoy a larger total market which enables them, by and large, to produce inks in larger volume and possibly at a lower unit cost. However, as noted in the quotations cited above, the Canadian sales are for the most part made up of many small orders; in supplying these, Canadian manufacturers do not necessarily face serious disadvantages, as is evidenced by the fact that they have continued to supply about 90 per cent of the Canadian market for all types of printing inks for many years. The importance of rapid service and close contact with the buyers tends to favour the domestic manufacturer.

B.T.N. heading 32.13 appears to encompass all of the inks now entered under tariff items 256, 256a and 257. It also provides for at least some of the inks for textile applications which are now imported duty-free under item 203d. B.T.N. heading 32.13 also provides for invisible, or sympathetic, inks; these are now entered at 15 p.c., B.P., 20 p.c., M.F.N., under item 220a because they are considered to be chemical preparations rather than inks.

The Primary Textiles Institute (P.T.I.) requested duty-free entry for inks used in textile applications. It proposed that this be accomplished by means of an extract from B.T.N. heading 32.13, worded as follows: "Inks adapted for colouring textiles, when of a kind not made in Canada."(3)

The inks that would qualify for entry under the proposed item are now entered duty-free under tariff item 203d; however, the proposed provision is narrower in scope than the existing item in that it is confined to inks "of a kind not made in Canada". The P.T.I. elaborated on the intended meaning of the word "kind" in relation to the proposed item; these representations have been noted in more detail, together with the P.T.I. proposals relating to other colouring materials of interest to the textile industry, in the section on colouring agents.

(1) Transcript, Vol. 100, p. 15230-32

(2) Same, Vol. 101, p. 15327-8

(3) Same, Vol. 100, p. 15223

The P.T.I. advised the Board that the industry was unable to indicate with any degree of certainty the quantity or value of inks that it now imports under item 203d, or that would qualify for entry under the proposed provision. Most of the colouring materials now imported for use in colouring or printing of textiles are in the form of pigments or dyes rather than inks. Imports entered under tariff item 203d in 1964, were valued at only \$146,000.

The spokesman for the Canadian Printing Ink Manufacturers' Association informed the Board that members of the Association were not manufacturing textile printing inks to any great extent and that, as a group, they were not opposing the exception requested by the textile industry.⁽¹⁾

The Canadian Pulp and Paper Association urged that the rates of duty for materials used by its members should not be increased. The spokesman for the Association said that any increase in costs of materials would make their products less competitive in world markets.⁽²⁾

No representations were received by the Board concerning writing inks or other inks, such as those for duplicating, typewriter ribbons, stamp pads or ball point pens. This lack of interest may stem from the fact that most writing inks and special inks are produced by companies whose principal interest is in other fields of activity.

(1) Transcript, Vol. 100, p. 15250; Vol. 101, p. 15265

(2) Same, Vol. 96, p. 14467; Vol. 36, p. 5462

APPENDIX IStatistical TablesImports

<u>Table</u>		<u>Page</u>
1	Chestnut extract	107
2	Quebracho extract	109
3	Wattle extract	111
4	Myrobalan extract	112
5	Spruce extract	113
6	Camwood and sumac and extract thereof	114
7	Hemlock extract	115
8	Non-edible seeds, beans, nuts, berries, plants, weeds, barks and woods, in a crude state or chipped or ground	116
9	Acid, tannic	118
10	Chemical compounds, n.o.p., adapted for dyeing or tanning	120
11	Extracts, n.o.p., for dyeing and tanning	122
12	Tanning and dyeing materials	123
13	Logwood and fustic, extract of	124
14	Terra japonica, gambier or cutch	125
15	Turmeric	127
16	Food colourings	129
17	Acid dyestuffs	130
18	Azoic dyestuffs	131
19	Basic dyestuffs	132
20	Chrome dyestuffs	133
21	Direct and developed dyestuffs	134
22	Dispersed (acetate) dyestuffs	135
23	Sulphur dyestuffs	136

<u>Table</u>	<u>Page</u>
24 Vat dyestuffs, including indigo	137
25 Oil, spirit and wax dyestuffs	138
26 Food, drug and cosmetic dyestuffs	139
27 Organic optical brighteners	140
28 Dyestuffs, n.o.p.	141
29 Textile pigments (except spin dyeing colours)	142
30 Indigo, indigo paste and extract of	143
31 Aniline and coal tar dyes, adapted for dyeing, in bulk or packages of not less than one pound weight	144
32 Aniline and coal tar dyes, n.o.p.	146
33 Pigments, colour lakes and toners, n.o.p.	148
34 Lithopone	149
35 Titanium dioxide, extended	151
36 Orange and yellow pigments	152
37 Blue and green pigments	153
38 Red and maroon pigments	154
39 Ultramarine blue, dry or in pulp	155
40 Luminescent, fluorescent or phosphorescent agents for paints, n.o.p.	156
41 Fluorescent coating or powder	157
42 Blueing, laundry	158
43 Oxides, fireproofs, rough stuff, fillers and colours, dry, n.o.p.	159
44 Ochres, ochrey earths, siennas and umbers	161
45 Ceramic, enamelling and glass paints	162

<u>Table</u>	<u>Page</u>
46 Stains and oxides, valued at not less than 20 cents per pound, for use as colouring constituents in the manufacture of vitreous enamels and pottery glazes; finely divided metals or compounds of metals, whether dry or suspended or dissolved in a liquid, for the manufacture of glassware and of tableware of china, porcelain or semi-porcelain	163
47 Varnishes and prepared shellacs	164
48 Lacquers	165
49 Paste paints, including white lead and paint colours in oil	166
50 Paints, n.o.p.	167
51 Special purpose paints, n.o.p.	168
52 Paints and colours, ground in spirits, and all spirit varnishes and lacquers	169
53 Varnish, lacquers, japans, japan driers, liquid driers, and oil finish, n.o.p.	170
54 Gold liquid paint	171
55 Artists' and school children's colours; fitted boxes containing the same; pastels, of a value of one cent per stick or over	172
56 Stains, thinners, fillers and related products, n.o.p.	174
57 Caulking, sealing and sound deadening compounds	174
58 Putty	175
59 Liquid fillers, anti-corrosive and anti-fouling paints, and ground and liquid paints, n.o.p.	176
60 Ink, printing	177
61 Ink, rotogravure	179
62 Ink, writing	180

Exports

<u>Table</u>		<u>Page</u>
1	Dyes and dyestuffs	182
2	Pigments, n.o.p.	182
3	Dyestuffs, pigments, lakes and toners	182
4	Enamels and lacquers	183
5	Paints, n.o.p.	183
6	Varnish	183
7	Putty	184
8	Ready-mixed paints, including white lead and colours in oils	184
9	Shellac and varnishes	184
10	Stains, lacquers, thinners, fillers and related products, n.e.s.	185
11	Printing ink	185
12	Ink, n.o.p.	185

Table 1

Imports: Chestnut extract, s.c. 8116^(a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>
	(000)	(000)	\$/lb.
<u>1. Total</u>			
1953	2,983	328	.11
1954	2,208	232	.11
1955	1,829	192	.11
1956	2,822	274	.10
1957	2,094	203	.10
1958	1,407	131	.09
1959	1,624	148	.09
1960 ^(b)	1,359	117	.09
1961	1,660	133	.08
1962	1,453	127	.09
1963	1,482	142	.10
1964	1,675	166	.10
<u>2. United States</u>			
1953	1,151	116	.10
1954	134	15	.11
1955	35	4	.12
1956	111	12	.11
1957	442	45	.10
1958	243	23	.10
1959	373	36	.10
1960	168	15	.09
1961	144	12	.08
1962	2	*	.12
1963	2	*	.11
1964	419	38	.09

Table 1
(Cont'd)

Year	<u>Total Imports</u>		Unit
	lb.	\$	Value
	(000)	(000)	\$/lb.
<u>3. France</u>			
1953	877	100	.11
1954	847	87	.10
1955	386	42	.11
1956	79	8	.10
1957	441	43	.10
1958	341	34	.10
1959	538	50	.09
1960	487	42	.09
1961	665	58	.09
1962	904	84	.09
1963	1,231	120	.10
1964	1,257	128	.10
<u>4. Italy</u>			
1953	915	107	.12
1954	1,227	130	.11
1955	1,408	146	.10
1956	2,631	254	.10
1957	1,211	115	.09
1958	823	74	.09
1959	670	59	.09
1960	705	59	.08
1961	851	63	.07
1962	547	43	.08
1963	249	22	.09
1964	-	-	-

(a) Beginning in 1964 renumbered as s.c. 396-10

(b) Includes \$592 of dutiable imports from Italy; duty collected \$118

Table 2

Imports: Quebracho extract, s.c. 8111(a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u> <u>Value</u> \$/lb
	lb. (000)	\$ (000)	
<u>1. Total</u>			
1953	10,227	1,136	.11
1954	6,174	692	.11
1955	8,201	932	.11
1956	9,130	1,057	.12
1957	6,278	625	.10
1958	7,324	668	.09
1959	7,493	692	.09
1960	6,010	478	.08
1961	7,971	579	.07
1962	7,765	591	.08
1963	5,024	407	.08
1964	6,680	575	.09
<u>2. United Kingdom</u>			
1953	199	19	.10
1954	-	-	-
1955	-	-	-
1956	-	-	-
1957	22	3	.14
1958	40	6	.14
1959	31	4	.13
1960	45	5	.11
1961-64	-	-	-
<u>3. United States</u>			
1953	936	109	.12
1954	852	108	.13
1955	729	97	.13
1956	713	90	.13
1957	502	52	.10
1958	158	18	.11
1959	55	6	.11
1960	1,145	123	.11
1961	1,073	81	.08
1962	628	75	.12
1963	185	22	.12
1964	21	3	.13

Table 2
(Cont'd)

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	lb.	\$	<u>Value</u>
	(000)	(000)	<u>\$/lb.</u>
<u>4. Argentina</u>			
1953	7,589	839	.11
1954	4,484	494	.11
1955	5,399	603	.11
1956	7,228	833	.12
1957	4,675	467	.10
1958	5,883	529	.09
1959	4,931	460	.09
1960	3,831	267	.07
1961	3,990	231	.06
1962	5,508	396	.07
1963	2,841	221	.08
1964	4,617	394	.09
<u>5. Paraguay</u>			
1953	1,427	159	.11
1954	714	79	.11
1955	2,027	227	.11
1956	1,186	134	.11
1957	1,079	103	.10
1958	1,242	116	.09
1959	2,477	222	.09
1960	989	83	.08
1961	2,904	267	.09
1962	1,628	121	.07
1963	1,998	164	.08
1964	2,042	178	.09

(a) Beginning in 1964 renumbered as s.c. 396-20

Imports: Wattle extract, s.c. 8119 (a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>
	(000)	(000)	\$/lb.
<u>1. Total</u>			
1953	2,371	221	.09
1954	2,366	202	.09
1955	1,958	172	.09
1956	2,610	226	.09
1957	1,707	131	.08
1958	1,637	119	.07
1959	1,646	115	.07
1960	1,742	115	.07
1961	1,731	105	.06
1962	2,015	137	.07
1963	1,805	129	.07
1964	2,253	180	.08
<u>2. United States</u>			
1953	338	33	.10
1954	161	16	.10
1955	2	*	.10
1956	2	*	.14
1957	193	16	.09
1958	173	14	.08
1959	29	3	.11
1960	145	11	.08
1961	137	9	.07
1962	270	20	.07
1963	-	-	-
1964	165	18	.11
<u>3. Union of South Africa</u>			
1953	1,767	158	.09
1954	1,993	165	.08
1955	1,797	157	.09
1956	2,389	205	.09
1957	1,302	97	.07
1958	1,219	85	.07
1959	1,292	88	.07
1960	1,006	60	.06
1961	1,110	63	.06
1962	1,267	81	.06
1963	1,698	120	.07
1964	2,088	162	.08

(a) Beginning in 1964 renumbered as s.c. 396-40

Imports: Myrobalan extract, s.c. 8118 (a)

Tariff Item 203

Year	Total Imports		Unit
	lb.	\$	Value
	(000)	(000)	\$/lb.
<u>1. Total</u>			
1953	375	16	.04
1954	104	5	.05
1955	238	16	.07
1956	237	19	.08
1957	299	20	.07
1958	105	6	.05
1959	172	11	.06
1960	68	5	.08
1961	-	-	-
1962	96	11	.11
1963	34	4	.11
<u>2. United Kingdom</u>			
1953	32	3	.09
1954	2	*	.09
1955	45	4	.08
1956	180	16	.09
1957	78	7	.09
1958	45	4	.08
1959	117	9	.08
1960	68	5	.08
1961	-	-	-
1962	45	5	.12
1963	22	2	.11
<u>3. United States</u>			
1953	59	2	.03
1954	102	5	.05
1955	77	5	.06
1956	57	2	.04
1957	221	13	.06
1958	5	*	.04
1959	-	-	-
1960	-	-	-
1961	-	-	-
1962	52	6	.11
1963	11	1	.12

(a) Beginning in 1964 included in s.c. 396-99

Imports: Spruce extract, s.c. 8117 (a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>
	(000)	(000)	\$/lb.
<u>1. Total</u>			
1953	738	33	.05
1954	517	23	.04
1955	251	14	.06
1956	444	13	.03
1957	73	4	.06
1958	89	2	.02
1959	85	1	.02
1960	27	1	.04
1961	65	2	.04
1962	2	*	.06
1963	5	*	.06
<u>2. United States</u>			
1953	738	33	.05
1954	517	23	.04
1955	251	14	.06
1956	444	13	.03
1957	73	4	.06
1958	89	2	.02
1959	85	1	.02
1960	27	1	.04
1961	65	2	.04
1962	2	*	.06
1963	5	*	.06

(a) Beginning in 1964 included in s.c. 396-99

Imports: Camwood and sumac and extract thereof, s.c. 8103^(a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value \$/lb.</u>
	<u>lb.</u> (000)	<u>\$</u> (000)	
	<u>1. Total</u>		
1953	25	4	.17
1954	34	4	.11
1955	18	2	.10
1956	11	1	.12
1957	14	1	.10
	<u>2. United States</u>		
1953	25	4	.17
1954	34	4	.11
1955	18	2	.10
1956	11	1	.12
1957	14	1	.10

(a) Beginning in 1958, included in s.c. 8121

Imports: Hemlock extract, s.c. 8120^(a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value \$/lb.</u>
	<u>lb.</u> (000)	<u>\$</u> (000)	
	<u>1. Total</u>		
1953	85	6	.07
1954	20	1	.07
1955	46	3	.07
1956	61	5	.07
1957	60	4	.07
	<u>2. United States</u>		
1953	85	6	.07
1954	20	1	.07
1955	46	3	.07
1956	61	5	.07
1957	60	4	.07

(a) Beginning in 1958 included in s.c. 8121

Table 8

Imports: Non-edible seeds, beans, nuts, berries, plants, weeds,
barks and woods, in a crude state or chipped or ground,
s.c. 8115(a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>
	(000)	(000)	\$/lb.
<u>1. Total</u>			
1953	582	26	.04
1954	400	78	.19
1955	155	12	.08
1956	146	11	.07
1957	185	18	.10
1958	103	8	.08
1959	385	22	.06
1960	118	7	.06
1961	165	14	.08
1962	268	9	.03
1963	201	8	.04
<u>2. United Kingdom</u>			
1953	-	-	-
1954	4	1	.31
1955	6	1	.18
1956	-	-	-
1957	*	*	.97
1958	13	2	.15
1959	20	3	.14
1960	8	2	.25
1961	44	4	.10
1962	-	-	-
1963	-	-	-

Table 8
(Cont'd)

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>
	(000)	(000)	\$/lb.
<u>3. United States</u>			
1953	329	16	.05
1954	134	11	.08
1955	86	9	.11
1956	71	8	.12
1957	149	16	.11
1958	22	4	.19
1959	282	17	.06
1960	111	5	.05
1961	120	9	.08
1962	244	8	.03
1963	153	6	.04
<u>4. Jamaica</u>			
1953	33	1	.03
1954	38	1	.03
1955	63	2	.03
1956	75	2	.03
1957	36	1	.03
1958	67	2	.03
1959	83	3	.03
1960	-	-	-
1961	-	-	-
1962	25	1	.04
1963	48	2	.04

(a) Beginning in 1964 included in s.c. 219-99

Table 9

Imports: Acid, tannic, s.c. 8020 (a)

Tariff Items 208 and 851

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value \$/lb.</u>
	<u>lb.</u> (000)	<u>\$</u> (000)	
	<u>1. Total</u>		
1953	391	66	.17
1954	333	72	.22
1955	314	60	.19
1956	56	48	.84
1957	44	52	1.17
1958	118	94	.80
1959	82	90	1.10
1960	39	46	1.18
1961	58	59	1.02
1962	73	54	.74
1963	78	43	.56

2. United Kingdom

1953	18	9	.48
1954	14	8	.55
1955	14	7	.53
1956	18	13	.69
1957	9	8	.91
1958	9	8	.90
1959	15	14	.92
1960	7	6	.92
1961	13	10	.72
1962	32	26	.81
1963	41	32	.76

3. United States

1953	62	14	.22
1954	13	17	1.34
1955	7	10	1.41
1956	4	6	1.54
1957	18	26	1.42
1958	15	17	1.10
1959	19	22	1.15
1960	11	16	1.47
1961	21	23	1.09
1962	35	21	.58
1963	10	7	.71

Table 9
(Cont'd)

Year	Total Imports		Unit
	lb.	\$	Value
	(000)	(000)	\$/lb.
<u>4. Switzerland</u>			
1953	11	11	.97
1954	13	14	1.03
1955	15	15	1.03
1956	13	15	1.09
1957	15	16	1.01
1958	-	-	-
1959	-	-	-
1960	4	2	.55
1961	10	6	.56
1962	-	-	-
1963	-	-	-
<u>5. Belgium and Luxembourg</u>			
1953	1	1	.81
1954	7	5	.72
1955	1	1	.83
1956	4	2	.60
1957	-	-	-
1958	30	34	1.13
1959	27	27	1.02
1960	12	14	1.14
1961	1	1	1.09
1962	-	-	-
1963	1	*	.88
<u>6. France</u>			
1953	103	15	.14
1954	64	9	.14
1955	69	11	.15
1956	17	11	.69
1957	-	-	-
1958	12	19	1.58
1959	9	11	1.31
1960	6	8	1.52
1961	14	21	1.52
1962	6	7	1.28
1963	25	4	.16

(a) Beginning in 1964 included in s.c. 396-99

Imports: Chemical compounds, n.o.p., adapted for dyeing or
tanning, s.c. 8104(a)

Tariff Items 203 and 203a(b)

Year	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	lb.	\$	\$/lb.	\$	\$	
	(000)	(000)		(000)		
<u>1. Total</u>						
1953	17,026	1,183	.07	-	-	-
1954	18,775	1,320	.07	-	-	-
1955	19,253	1,502	.08	-	-	-
1956	19,816	1,578	.08	-	-	-
1957	29,526	1,657	.06	-	-	-
1958	23,354	1,400	.06	-	-	-
1959	22,962	1,382	.06	23	4,030	17.8
1960	7,986	1,201	.15	12	1,742	15.1
1961	13,380	2,294	.17	17	1,676	9.7
1962	4,195	605	.14	14	2,489	18.9
1963	3,590	532	.15	11	2,027	18.8
<u>2. United Kingdom</u>						
1953	1,205	185	.15	-	-	-
1954	1,936	282	.15	-	-	-
1955	1,693	337	.20	-	-	-
1956	1,414	272	.19	-	-	-
1957	1,547	319	.21	-	-	-
1958	835	173	.21	-	-	-
1959	872	178	.20	-	-	-
1960	676	157	.23	-	-	-
1961	1,877	419	.22	-	-	-
1962	63	15	.23	-	-	-
1963	41	8	.20	-	-	-
<u>3. United States</u>						
1953	14,954	901	.06	-	-	-
1954	16,155	815	.05	-	-	-
1955	16,687	924	.06	-	-	-
1956	17,296	1,054	.06	-	-	-
1957	26,311	1,011	.04	-	-	-
1958	20,681	901	.04	-	-	-
1959	20,533	936	.05	23	4,030	17.8
1960	6,008	810	.13	12	1,742	15.1
1961	9,280	1,417	.15	17	1,676	9.7
1962	3,397	448	.13	12	2,344	19.5
1963	2,928	400	.14	10	1,841	19.3

Table 10 (Cont'd)

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>4. Germany, Fed. Rep. of</u>						
1953	395	51	.13	-	-	-
1954	549	169	.31	-	-	-
1955	726	187	.26	-	-	-
1956	880	183	.21	-	-	-
1957	1,244	250	.20	-	-	-
1958	1,423	246	.17	-	-	-
1959	1,134	206	.18	-	-	-
1960	1,033	178	.17	-	-	-
1961	1,820	375	.21	-	-	-
1962	662	113	.17	-	-	-
1963	556	97	.17	1	186	15.0
<u>5. France</u>						
1953	77	9	.12	-	-	-
1954	62	12	.19	-	-	-
1955	95	17	.18	-	-	-
1956	112	25	.22	-	-	-
1957	177	27	.15	-	-	-
1958	134	16	.12	-	-	-
1959	91	15	.17	-	-	-
1960	58	10	.17	-	-	-
1961	154	26	.17	-	-	-
1962	3	1	.34	-	-	-
1963	15	3	.18	-	-	-
<u>6. Switzerland</u>						
1953	379	35	.09	-	-	-
1954	30	25	.82	-	-	-
1955	40	29	.73	-	-	-
1956	113	44	.39	-	-	-
1957	190	47	.25	-	-	-
1958	169	47	.28	-	-	-
1959	100	27	.28	-	-	-
1960	114	33	.29	-	-	-
1961	149	39	.26	-	-	-
1962	48	24	.51	-	-	-
1963	50	22	.44	-	-	-

(a) Beginning in 1958 includes former s.c. 8107; beginning in 1964 included in s.c. 396-89 and 429-99

(b) Tariff Item 203a was included beginning in 1962

Imports: Extracts, n.o.p., for dyeing and tanning, s.c. 8121 (a)

Tariff Item 203

Year	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	lb. (000)	\$ (000)	\$/lb.	\$ (000)	\$	
<u>1. Total</u>						
1958	2,435	141	.06	-	-	-
1959	1,409	192	.14	2	183	10.0
1960	875	199	.23	2	364	15.7
1961	996	260	.26	6	652	10.1
1962	1,029	193	.19	*	90	20.0
1963	731	136	.19	*	50	20.0
<u>2. United Kingdom</u>						
1958	11	7	.60	-	-	-
1959	14	6	.43	-	-	-
1960	15	5	.34	-	-	-
1961	82	10	.12	-	-	-
1962	75	8	.11	-	-	-
1963	48	5	.11	-	-	-
<u>3. United States</u>						
1958	2,282	123	.05	-	-	-
1959	1,374	181	.13	1	127	10.0
1960	803	181	.23	2	307	17.5
1961	902	241	.27	6	652	10.1
1962	751	172	.23	*	90	20.0
1963	650	127	.20	*	50	20.0
<u>4. Germany, Fed. Rep. of</u>						
1958	2	2	.99	-	-	-
1959	1	3	6.97	-	-	-
1960	37	12	.33	-	-	-
1961	1	8	7.52	-	-	-
1962	3	1	.38	-	-	-
1963	9	2	.20	-	-	-

(a) Prior to 1958, included in s.c. 8103 and s.c. 8120; beginning in 1964 included in 396-99

Imports: Tanning and dyeing materials

Table 12

		<u>Calendar Year, 1964</u>		<u>Principal Countries</u>	<u>Usual Tariff Items</u>	<u>Total Imports lb. \$ (000) (000)</u>	<u>Unit Value \$/lb.</u>	<u>Former Statistical Classes^(a)</u>
Synthetic tanning agents n.e.s., s.c. 396-89	203a, 208t 220a(i)	All Countries	5,120	585	.11	8104*		
		United States	4,199	407	.10	8121*		
		Germany	817	141	.17	8415*		
Natural tanning and dyeing extracts n.e.s., s.c. 396-99	203,208, 851	All Countries	1,192	229	.19	various		
		United Kingdom	96	30	.31			
		United States	748	123	.16			
		India	259	61	.24			
Crude vegetable materials, inedible n.e.s., s.c. 219-99	various	All Countries	-	1,189	-	various		
		United Kingdom	-	32	-			
		United States	-	827	-			
		Jamaica	-	8	-			

(a) An asterisk denotes only part of former s.c. included in present class

Table 13

Imports: Logwood and fustic, extract of, s.c. 8109^(a)

Tariff Item 203

Year	Total Imports		Unit Value
	lb.	\$	\$/lb.
	(000)	(000)	
<u>1. Total</u>			
1953	74	22	.30
1954	62	18	.30
1955	51	17	.33
1956	72	23	.31
1957	72	26	.36
1958	55	20	.37
1959	62	25	.39
1960	40	16	.41
1961	33	14	.42
1962	49	21	.43
1963	82	35	.43
<u>2. United States</u>			
1953	73	22	.30
1954	61	18	.30
1955	51	17	.33
1956	71	22	.32
1957	64	23	.36
1958	52	19	.37
1959	60	23	.39
1960	38	16	.41
1961	33	14	.42
1962	46	20	.44
1963	81	34	.43

(a) Beginning in 1964 included in s.c. 396-99

Imports: Terra japonica, gambier or cutch, s.c. 8113(a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value \$/lb.</u>
	<u>lb.</u> (000)	<u>\$</u> (000)	
	<u>1. Total</u>		
1953	243	32	.13
1954	165	22	.13
1955	167	22	.13
1956	226	31	.14
1957	131	16	.12
1958	194	21	.11
1959	220	20	.09
1960	184	16	.09
1961	178	15	.08
1962	96	9	.09
1963	227	23	.10

	<u>2. United Kingdom</u>		
1953	163	23	.14
1954	160	21	.13
1955	155	21	.14
1956	189	24	.13
1957	120	14	.12
1958	166	19	.12
1959	96	11	.11
1960	74	8	.10
1961	127	11	.09
1962	58	6	.10
1963	122	13	.10

Table 14
(Cont'd)

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>
	(000)	(000)	\$/lb.
<u>3. United States</u>			
1953	26	3	.12
1954	5	1	.12
1955	11	1	.11
1956	12	1	.12
1957	6	1	.12
1958	2	*	.13
1959	39	3	.08
1960	4	1	.14
1961	1	*	.11
1962	-	-	-
1963	-	-	-
<u>4. Germany, Fed. Rep. of</u>			
1953-62	-	-	-
1963	92	9	.10
<u>5. Other British East Indies</u>			
1953-54	-	-	-
1955	2	*	.10
1956	-	-	-
1957	5	*	.09
1958	26	2	.06
1959	85	6	.07
1960	92	7	.07
1961	39	3	.07
1962	38	3	.08
1963	-	-	-

(a) Beginning in 1964 included in s.c. 396-99

Table 15

Imports: Turmeric, s.c. 8114^(a)

Tariff Item 203

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>
	lb. (000)	\$ (000)	\$/lb.
	<u>1. Total</u>		
1953	129	17	.13
1954	161	28	.17
1955	166	33	.20
1956	214	34	.16
1957	190	19	.10
1958	156	12	.08
1959	200	21	.10
1960	181	29	.16
1961	207	31	.15
1962	267	49	.18
1963	334	66	.20
	<u>2. United States</u>		
1953	38	6	.16
1954	4	1	.22
1955	27	5	.19
1956	26	4	.16
1957	10	1	.13
1958	-	-	-
1959	-	-	-
1960	2	1	.28
1961	9	2	.25
1962	21	6	.28
1963	7	2	.25

Table 15
(Cont'd)

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>
	lb. (000)	\$ (000)	\$/lb.
<u>3. India</u>			
1953	86	10	.12
1954	144	25	.17
1955	121	24	.20
1956	173	28	.16
1957	157	16	.10
1958	145	11	.08
1959	170	18	.11
1960	159	26	.16
1961	142	22	.15
1962	213	39	.18
1963	311	62	.20
<u>4. Jamaica</u>			
1953	-	-	-
1954	6	1	.10
1955	6	1	.11
1956	15	1	.10
1957	23	2	.08
1958	11	1	.08
1959	30	2	.08
1960	-	-	-
1961	56	7	.13
1962	34	5	.13
1963	14	2	.12

(a) Beginning in 1964 included in s.c. 396-99

Table 16

Imports: Food colourings, s.c. 550^(a)

Tariff Items 90f, 203, 220a1 and 246

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$ (000)	\$	Dutiable Value
<u>1. Total</u>						
1963	621	364	.59	282	30,823	10.9
1964	690	395	.57	265	29,365	11.0
<u>2. United Kingdom</u>						
1963	36	21	.58	21	2,846	13.8
1964	53	24	.45	24	3,172	13.5
<u>3. United States</u>						
1963	584	339	.58	257	27,394	10.7
1964	629	363	.58	235	25,359	10.8

^(a) Prior to 1963 included in s.c. 1839 and 8121; beginning in 1964 renumbered as s.c. 146-50

Table 17

Imports: Acid dyestuffs, s.c. 8911^(a)

Tariff Items 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>\$/lb.</u>	<u>\$</u>	<u>\$</u>	
	(000)	(000)		(000)		
<u>1. Total</u>						
1962	1,232	2,000	1.62	2	260	15.0
1963	1,576	2,445	1.55	*	69	15.1
1964	1,581	2,572	1.63	-	-	-
<u>2. United Kingdom</u>						
1962	175	230	1.31	2	260	15.0
1963	270	318	1.18	-	-	-
1964	260	363	1.40	-	-	-
<u>3. United States</u>						
1962	461	786	1.71	-	-	-
1963	669	1,070	1.60	*	69	15.1
1964	534	970	1.75	-	-	-
<u>4. Germany, Fed. Rep. of</u>						
1962	190	228	1.20	-	-	-
1963	287	369	1.28	-	-	-
1964	306	392	1.28	-	-	-
<u>5. Switzerland</u>						
1962	250	614	2.46	-	-	-
1963	253	594	2.35	-	-	-
1964	302	723	2.40	-	-	-

(a) Prior to 1962 included in s.c. 8091; beginning in 1964 renumbered as s.c. 426-05

Table 18

Imports: Azoic dyestuffs, s.c. 8913(a)

Tariff Items 203b, 203f and 203c

Year	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	<u>p.c. of</u>
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	313	461	1.47	-	-	-
1963	389	528	1.36	*	89	20.0
1964	493	613	1.24	3	496	17.5
<u>2. United Kingdom</u>						
1962	7	12	1.87	-	-	-
1963	23	30	1.28	-	-	-
1964	16	25	1.59	-	-	-
<u>3. United States</u>						
1962	128	231	1.81	-	-	-
1963	198	296	1.50	*	89	20.0
1964	278	354	1.27	-	-	-
<u>4. Germany, Fed. Rep. of</u>						
1962	138	171	1.24	-	-	-
1963	136	170	1.25	-	-	-
1964	170	189	1.11	3	496	17.5
<u>5. Switzerland</u>						
1962	11	16	1.49	-	-	-
1963	11	10	.90	-	-	-
1964	20	31	1.55	-	-	-

(a) Prior to 1962 included in s.c. 8091 and 8095; beginning in 1964 renumbered as s.c. 426-08

Imports: Basic dyestuffs, s.c. 8915(a)

Tariff Items 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
<u>1. Total</u>						
1962	859	1,537	1.79	3	485	15.1
1963	1,091	1,807	1.66	9	1,548	17.7
1964	1,331	2,253	1.69	11	2,113	18.6
<u>2. United Kingdom</u>						
1962	231	346	1.50	-	-	-
1963	239	329	1.37	-	-	-
1964	229	327	1.43	-	-	-
<u>3. United States</u>						
1962	292	676	2.31	3	485	15.1
1963	407	782	1.92	7	1,277	17.8
1964	450	915	2.03	11	2,113	18.6
<u>4. Germany, Fed. Rep. of</u>						
1962	173	305	1.76	-	-	-
1963	319	501	1.57	*	85	17.5
1964	533	816	1.53	-	-	-
<u>5. Switzerland</u>						
1962	56	85	1.51	-	-	-
1963	40	83	2.07	-	-	-
1964	46	87	1.90	-	-	-
<u>6. Netherlands</u>						
1962	68	89	1.31	-	-	-
1963	66	91	1.37	1	186	17.5
1964	47	84	1.78	-	-	-

(a) Prior to 1962 included in s.c. 8091; beginning in 1964 renumbered as s.c. 426-10

Table 20

Imports: Chrome dyestuffs, s.c. 8917^(a)

Tariff Items 203a, 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	<u>p.c. of</u>
	(000)	(000)	\$/lb.	\$(000)	\$(000)	Dutiable Value
<u>1. Total</u>						
1962	357	350	.98	-	-	-
1963	337	312	.93	*	68	15.0
1964	377	367	.97	-	-	-
<u>2. United Kingdom</u>						
1962	33	37	1.11	-	-	-
1963	49	42	.86	*	68	15.0
1964	57	52	.92	-	-	-
<u>3. United States</u>						
1962	74	94	1.26	-	-	-
1963	70	68	.98	-	-	-
1964	102	103	1.01	-	-	-
<u>4. Germany, Fed. Rep. of</u>						
1962	53	53	1.00	-	-	-
1963	65	60	.91	-	-	-
1964	109	101	.92	-	-	-
<u>5. Switzerland</u>						
1962	95	95	1.00	-	-	-
1963	121	108	.89	-	-	-
1964	70	70	1.00	-	-	-

(a) Prior to 1962 included in s.c. 8091 and 8104; beginning in 1964 renumbered as s.c. 426-15

Table 21

Imports: Direct and developed dyestuffs, s.c. 8919(a)

Tariff Item 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>\$/lb.</u>	<u>\$</u>	<u>\$</u>	
	(000)	(000)		(000)		
<u>1. Total</u>						
1962	1,682	2,418	1.44	-	-	-
1963	1,799	2,582	1.44	1	113	15.0
1964	2,009	2,926	1.46	3	486	19.1
<u>2. United Kingdom</u>						
1962	275	275	1.00	-	-	-
1963	274	248	.91	-	-	-
1964	344	353	1.03	-	-	-
<u>3. United States</u>						
1962	579	1,057	1.83	-	-	-
1963	630	1,121	1.78	1	113	15.0
1964	768	1,332	1.73	1	212	19.9
<u>4. Germany, Fed. Rep. of</u>						
1962	289	329	1.14	-	-	-
1963	333	413	1.24	-	-	-
1964	335	418	1.25	1	145	17.4
<u>5. Italy</u>						
1962	173	110	.64	-	-	-
1963	106	71	.67	-	-	-
1964	104	66	.63	-	-	-
<u>6. Switzerland</u>						
1962	268	550	2.05	-	-	-
1963	315	616	1.96	-	-	-
1964	300	613	2.04	-	-	-

(a) Prior to 1962 included in s.c. 8091; beginning in 1964 renumbered as s.c. 426-20

Table 22

Imports: Dispersed (acetate) dyestuffs, s.c. 8921^(a)

Tariff Items 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$ (000)	\$	
<u>1. Total</u>						
1962	637	1,459	2.29	4	800	18.1
1963	618	1,473	2.39	2	336	21.6
1964	764	1,739	2.28	4	636	16.8
<u>2. United Kingdom</u>						
1962	17	50	2.88	-	-	-
1963	20	62	3.17	-	-	-
1964	64	99	1.55	2	345	14.9
<u>3. United States</u>						
1962	462	1,048	2.27	4	781	19.4
1963	436	987	2.26	2	336	21.6
1964	513	1,174	2.29	1	291	19.9
<u>4. Germany, Fed. Rep. of</u>						
1962	116	280	2.41	*	19	4.9
1963	116	326	2.80	-	-	-
1964	127	320	2.52	-	-	-
<u>5. Switzerland</u>						
1962	38	77	2.04	-	-	-
1963	41	94	2.31	-	-	-
1964	58	143	2.48	-	-	-

^(a) Prior to 1962 included in s.c. 8091; beginning in 1964 renumbered as s.c. 426-21

Table 23

Imports: Sulphur dyestuffs, s.c. 8923^(a)

Tariff Items 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>\$/lb.</u>	<u>\$</u>	<u>\$</u>	
	(000)	(000)		(000)		
<u>1. Total</u>						
1962	936	337	.36	-	-	-
1963	886	435	.49	-	-	-
1964	839	461	.55	2	280	16.8
<u>2. United Kingdom</u>						
1962	10	6	.58	-	-	-
1963	20	14	.72	-	-	-
1964	5	4	.87	-	-	-
<u>3. United States</u>						
1962	788	240	.30	-	-	-
1963	595	175	.29	-	-	-
1964	488	127	.26	1	245	17.1
<u>4. Germany, Fed. Rep. of</u>						
1962	76	63	.83	-	-	-
1963	206	214	1.03	-	-	-
1964	249	295	1.18	*	35	14.6
<u>5. Netherlands</u>						
1962	15	5	.34	-	-	-
1963	26	8	.32	-	-	-
1964	45	14	.30	-	-	-
<u>6. Poland</u>						
1962	5	2	.31	-	-	-
1963	11	2	.19	-	-	-
1964	40	7	.19	-	-	-

(a) Prior to 1962 included in s.c. 8091; beginning in 1964 renumbered as s.c. 426-25

Table 24

Imports: Vat dyestuffs, including indigo, s.c. 8925^(a)

Tariff Items 203, 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>\$/lb.</u>	<u>\$</u>	<u>\$</u>	
	(000)	(000)		(000)		
<u>1. Total</u>						
1962	665	1,401	2.11	10	2,405	24.8
1963	534	1,317	2.47	1	247	20.0
1964	485	1,310	2.70	14	2,432	17.9
<u>2. United Kingdom</u>						
1962	27	100	3.72	-	-	-
1963	33	139	4.20	-	-	-
1964	53	209	3.96	-	-	-
<u>3. United States</u>						
1962	407	687	1.69	10	2,405	24.8
1963	343	740	2.16	1	247	20.0
1964	194	423	2.18	13	2,356	17.9
<u>4. Germany, Fed. Rep. of</u>						
1962	154	414	2.70	-	-	-
1963	97	260	2.68	-	-	-
1964	178	496	2.79	*	76	17.5
<u>5. Switzerland</u>						
1962	46	134	2.89	-	-	-
1963	31	102	3.24	-	-	-
1964	38	128	3.36	-	-	-

(a) Prior to 1962 included in s.c. 8091 and 8106; beginning in 1964 renumbered as s.c. 426-30

Table 25

Imports: Oil, spirit and wax dyestuffs, s.c. 8927^(a)

Tariff Items 203a, 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
			(000)	(000)		
<u>1. Total</u>						
1962	448	649	1.45	37	6,515	17.8
1963	396	569	1.44	17	3,042	17.9
1964	512	876	1.71	80	13,980	17.5
<u>2. United Kingdom</u>						
1962	268	258	.96	*	14	12.2
1963	231	218	.94	-	-	-
1964	210	239	1.14	-	-	-
<u>3. United States</u>						
1962	145	322	2.23	36	6,398	17.8
1963	150	311	2.08	17	3,023	17.9
1964	274	574	2.10	80	13,980	17.5
<u>4. Germany, Fed. Rep. of</u>						
1962	18	38	2.13	1	103	17.5
1963	9	28	3.26	*	19	17.9
1964	18	30	1.68	-	-	-
<u>5. Switzerland</u>						
1962	6	20	3.12	-	-	-
1963	2	9	3.80	-	-	-
1964	3	15	4.21	-	-	-

(a) Prior to 1962 included in s.c. 8091 and 8104; beginning in 1964 renumbered as s.c. 426-40

Table 26

Imports: Food, drug and cosmetic dyestuffs, s.c. 8929^(a)

Tariff Items 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
				(000)		
			<u>1. Total</u>			
1962	168	408	2.43	3	515	18.1
1963	146	412	2.82	3	446	16.4
1964	167	373	2.24	.4	826	19.6
			<u>2. United Kingdom</u>			
1962	43	76	1.77	-	-	-
1963	44	95	2.15	-	-	-
1964	34	75	2.22	-	-	-
			<u>3. United States</u>			
1962	113	314	2.77	3	515	18.1
1963	92	303	3.30	2	419	17.1
1964	116	268	2.32	4	826	19.6
			<u>4. Germany, Fed. Rep. of</u>			
1962	4	6	1.35	-	-	-
1963	1	2	1.75	-	-	-
1964	2	4	1.87	-	-	-
			<u>5. Netherlands</u>			
1962	7	11	1.61	-	-	-
1963	5	8	1.67	-	-	-
1964	14	24	1.71	-	-	-
			<u>6. Switzerland</u>			
1962	*	*	1.69	-	-	-
1963	4	4	1.02	-	-	-
1964	1	2	1.94	-	-	-

(a) Prior to 1962 included in s.c. 8091; beginning in 1964 renumbered as s.c. 426-45

Table 27

Imports: Organic optical brighteners, s.c. 8931^(a)

Tariff Items 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	Value
				(000)		
<u>1. Total</u>						
1962	760	1,148	1.51	2	386	19.4
1963	1,156	1,246	1.08	77	11,802	15.3
1964	881	1,280	1.45	19	3,511	18.6
<u>2. United Kingdom</u>						
1962	41	59	1.44	-	-	-
1963	37	51	1.35	-	-	-
1964	40	50	1.26	-	-	-
<u>3. United States</u>						
1962	429	542	1.26	1	216	19.1
1963	720	745	1.04	5	942	19.2
1964	574	788	1.37	18	3,432	18.6
<u>4. Germany, Fed. Rep. of</u>						
1962	96	151	1.57	-	-	-
1963	263	255	.97	72	10,860	15.0
1964	125	235	1.89	-	-	-
<u>5. Switzerland</u>						
1962	189	391	2.07	1	170	19.8
1963	136	196	1.43	-	-	-
1964	142	205	1.45	*	79	19.9

(a) Prior to 1962 included in s.c. 8091; beginning in 1964 renumbered as s.c. 426-69

Table 28

Imports: Dyestuffs, n.o.p., s.c. 8939^(a)

Tariff Items 203b, 203c, 203g and 711

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	836	847	1.01	65	9,733	15.0
1963	707	668	.95	32	3,580	11.2
1964	943	1,171	1.24	56	7,414	13.3
<u>2. United Kingdom</u>						
1962	62	111	1.79	14	2,143	15.3
1963	25	41	1.65	4	603	14.4
1964	94	93	.99	5	696	14.9
<u>3. United States</u>						
1962	647	473	.73	46	6,553	14.3
1963	579	434	.75	23	2,056	8.8
1964	656	800	1.22	47	5,953	12.6
<u>4. Germany, Fed. Rep. of</u>						
1962	70	136	1.95	4	745	20.1
1963	60	110	1.84	3	638	21.2
1964	110	141	1.28	3	527	19.8
<u>5. Switzerland</u>						
1962	46	115	2.50	1	292	20.6
1963	28	72	2.56	1	283	19.1
1964	46	110	2.36	1	238	18.1

(a) Prior to 1962 included in s.c. 8036, 8091 and 8415; beginning in 1964 renumbered as s.c. 426-99, which also includes part of former s.c. 8900 and tariff items 203e and 203f

Table 29

Imports: Textile pigments (except spin dyeing colours), s.c. 8949^(a)

Tariff Item 203d

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	1,778	1,023	.58	2	365	20.2
1963	2,431	1,440	.59	4	575	14.5
1964	2,168	1,130	.52	4	735	19.9
<u>2. United Kingdom</u>						
1962	1	2	2.20	-	-	-
1963	8	7	.81	-	-	-
1964	9	42	4.61	-	-	-
<u>3. United States</u>						
1962	1,442	737	.51	2	365	20.2
1963	1,799	975	.54	3	442	13.8
1964	1,651	754	.46	4	735	19.9
<u>4. Germany, Fed. Rep. of</u>						
1962	329	279	.85	-	-	-
1963	611	441	.72	1	133	17.6
1964	495	316	.64	-	-	-
<u>5. Switzerland</u>						
1962	6	4	.74	-	-	-
1963	7	8	1.22	-	-	-
1964	7	12	1.79	-	-	-

(a) Prior to 1962 included in s.c. 8415; beginning in 1964 renumbered as s.c. 427-49

Imports: Indigo, indigo paste and extract of, s.c. 8106^(a)

Tariff Item 203

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	196	143	.73	-	-	-
1954	71	54	.75	-	-	-
1955	195	148	.76	-	-	-
1956	132	110	.83	-	-	-
1957	72	56	.78	-	-	-
1958	-	-	-	-	-	-
1959	3	2	.82	2	457	20.0
1960	2	3	1.23	-	-	-
1961	3	3	1.33	-	-	-
<u>2. United Kingdom</u>						
1953	194	142	.73	-	-	-
1954	70	53	.75	-	-	-
1955	193	147	.76	-	-	-
1956	131	109	.83	-	-	-
1957	71	56	.78	-	-	-
1958-61	-	-	-	-	-	-
<u>3. United States</u>						
1953	1	1	.56	-	-	-
1954	1	1	.69	-	-	-
1955	2	1	.43	-	-	-
1956	1	1	1.81	-	-	-
1957	*	*	.92	-	-	-
1958	-	-	-	-	-	-
1959	3	2	.82	2	457	20.0
1960	2	3	1.23	-	-	-
1961	3	3	1.33	-	-	-

^(a) Beginning in 1962 included in s.c. 8925

Imports: Aniline and coal tar dyes, adapted for dyeing, in bulk
or packages of not less than one pound weight, s.c. 8091 ^(a)

Tariff Items 203b and 203c

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>
	lb. (000)	\$ (000)	\$/lb.
<u>1. Total</u>			
1953	4,742	6,411	1.35
1954	5,182	6,551	1.26
1955	6,002	7,968	1.33
1956	5,721	7,679	1.34
1957	5,861	7,641	1.30
1958	5,917	8,003	1.35
1959	6,451	8,348	1.29
1960	6,860	8,624	1.26
1961	8,116	10,910	1.34
<u>2. United Kingdom</u>			
1953	641	815	1.27
1954	715	841	1.18
1955	976	1,034	1.06
1956	1,102	1,154	1.05
1957	1,052	1,113	1.06
1958	1,036	1,157	1.12
1959	1,155	1,353	1.17
1960	999	1,124	1.13
1961	1,134	1,448	1.28
<u>3. United States</u>			
1953	3,312	4,124	1.25
1954	3,541	4,124	1.16
1955	3,814	4,982	1.31
1956	3,458	4,649	1.34
1957	3,582	4,646	1.30
1958	3,457	4,666	1.35
1959	3,592	4,438	1.24
1960	3,850	4,632	1.20
1961	4,563	5,782	1.27

Table 31
(Cont'd)

<u>Year</u>	<u>Total Imports</u>		<u>.Unit Value</u>
	lb. (000)	\$ (000)	\$/lb.
<u>4. Switzerland</u>			
1953	475	1,074	2.26
1954	512	1,126	2.20
1955	690	1,346	1.95
1956	621	1,208	1.95
1957	597	1,136	1.90
1958	693	1,297	1.87
1959	719	1,344	1.87
1960	764	1,462	1.92
1961	1,001	1,867	1.87
<u>5. Germany, Fed. Rep. of</u>			
1953	129	155	1.19
1954	302	319	1.06
1955	328	378	1.15
1956	321	369	1.15
1957	435	509	1.17
1958	451	624	1.38
1959	673	948	1.41
1960	822	1,043	1.27
1961	910	1,346	1.48
<u>6. France</u>			
1953	64	106	1.64
1954	57	90	1.58
1955	125	158	1.26
1956	174	253	1.46
1957	129	179	1.39
1958	167	157	.94
1959	186	163	.88
1960	216	219	1.02
1961	213	242	1.14

(a) Beginning in 1962 included in various statistical classes

Table 32

Imports: Aniline and coal tar dyes, n.o.p., s.c. 8092^(a)

Tariff Item 246

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	114	128	1.12	125	21,452	17.1
1954	37	90	2.43	89	15,495	17.5
1955	42	76	1.81	72	12,680	17.6
1956	41	111	2.67	99	17,246	17.4
1957	77	279	3.60	261	45,513	17.5
1958	96	346	3.61	336	58,670	17.4
1959	3	9	2.83	9	1,583	17.1
1960	*	14	475.07	14	2,412	17.5
1961	*	15	329.74	15	2,713	17.5
<u>2. United Kingdom</u>						
1953	8	9	1.08	9	1,104	12.5
1954	-	-	-	-	-	-
1955	-	-	-	-	-	-
1956	2	2	1.48	2	309	12.5
1957	1	2	1.57	2	255	12.5
1958	2	4	1.54	4	457	12.5
1959	3	1	.33	1	104	12.5
1960-61	-	-	-	-	-	-
<u>3. United States</u>						
1953	102	114	1.13	112	19,594	17.5
1954	34	86	2.49	84	14,690	17.5
1955	36	70	1.95	66	11,538	17.6
1956	40	108	2.72	97	16,937	17.5
1957	54	255	4.70	237	41,471	17.5
1958	68	314	4.64	305	53,299	17.5
1959	1	8	12.66	8	1,456	17.5
1960	*	14	475.07	14	2,412	17.5
1961	*	15	329.74	15	2,713	17.5

Table 32
(Cont'd)

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
4. Germany, Fed. Rep. of						
1953-56	-	-	-	-	-	-
1957	5	5	1.06	5	893	17.5
1958	*	1	3.05	1	187	17.5
1959	*	*	1.05	*	23	17.6
1960-61	-	-	-	-	-	-
5. Denmark						
1953	4	4	1.15	4	754	17.5
1954	3	5	1.67	5	805	17.5
1955	6	7	1.02	7	1,142	17.5
1956	-	-	-	-	-	-
1957	17	16	.96	16	2,807	17.5
1958	23	22	.96	22	3,877	17.5
1959-61	-	-	-	-	-	-
6. Switzerland						
1953-56	-	-	-	-	-	-
1957	*	*	2.25	*	87	17.6
1958	2	5	2.09	5	850	17.5
1959-61	-	-	-	-	-	-

(a) Beginning in 1962 included in s.c. 8941, 8945, 8947 and 8959

Table 33

Imports: Pigments, colour lakes and toners, n.o.p., s.c. 8959^(a)

Tariff Items 220a(i), 245, 246, 246d and 711

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	2,695	1,143	.42	1,059	193,884	18.3
1963	1,823	1,090	.60	971	177,115	18.2
1964	3,591	1,896	.53	1,581	289,425	18.3
<u>2. United Kingdom</u>						
1962	82	47	.57	42	5,178	12.3
1963	84	33	.39	31	3,849	12.3
1964	307	59	.19	58	6,935	12.0
<u>3. United States</u>						
1962	2,385	1,073	.45	994	185,060	18.6
1963	1,490	1,018	.68	903	167,857	18.6
1964	3,059	1,779	.58	1,466	273,001	18.6
<u>4. Germany, Fed. Rep. of</u>						
1962	18	15	.82	14	2,473	17.8
1963	55	22	.40	21	3,429	16.0
1964	18	31	1.73	30	5,257	17.5
<u>5. Switzerland</u>						
1962	-	-	-	-	-	-
1963	*	1	1.54	1	100	17.4
1964	13	15	1.15	15	2,702	18.6

^(a) Prior to 1962 included in s.c. 8092, 8189, 8201 and 8415; beginning in 1964 renumbered as s.c. 427-99

Table 34

Imports: Lithopone, s.c. 8951^(a)

Tariff Item 242

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	6,697	475	.07	337	42,102	12.5
1954	5,083	350	.07	236	29,467	12.5
1955	3,789	265	.07	196	24,459	12.5
1956	4,591	348	.08	189	23,602	12.5
1957	2,731	197	.07	123	15,438	12.5
1958	2,483	180	.07	94	11,738	12.5
1959	1,959	138	.07	74	9,263	12.5
1960	1,787	122	.07	66	8,295	12.5
1961	1,259	91	.07	59	7,412	12.5
1962	1,468	120	.08	79	10,079	12.8
1963	781	59	.08	48	6,009	12.5
1964	1,078	81	.08	60	7,235	12.1
<u>2. United Kingdom</u>						
1953	2,151	137	.06	-	-	-
1954	1,802	114	.06	-	-	-
1955	1,097	70	.06	-	-	-
1956	2,001	159	.08	-	-	-
1957	1,067	74	.07	-	-	-
1958	1,271	86	.07	-	-	-
1959	946	64	.07	-	-	-
1960	790	55	.07	-	-	-
1961	425	32	.08	-	-	-
1962	503	41	.08	-	-	-
1963	139	11	.08	-	-	-
1964	250	21	.09	-	-	-
<u>3. United States</u>						
1953	4,317	325	.08	324	40,548	12.5
1954	2,822	210	.07	209	26,151	12.5
1955	1,988	151	.08	151	18,843	12.5
1956	1,652	127	.08	127	15,839	12.5
1957	970	80	.08	80	9,982	12.5
1958	649	56	.09	56	7,039	12.5
1959	388	36	.09	36	4,441	12.5
1960	245	21	.08	21	2,584	12.5
1961	293	26	.09	26	3,211	12.5
1962	167	23	.14	23	3,166	13.5
1963	206	19	.09	19	2,360	12.5
1964	136	13	.10	13	1,625	12.4

Table 34
(Cont'd)

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>4. Germany, Fed. Rep. of</u>						
1953	130	7	.06	7	923	12.5
1954	374	22	.06	22	2,716	12.5
1955	471	32	.07	32	4,043	12.5
1956	711	49	.07	49	6,136	12.5
1957	478	31	.06	31	3,877	12.5
1958	498	34	.07	34	4,285	12.5
1959	419	28	.07	28	3,484	12.5
1960	63	3	.05	3	395	12.5
1961	179	11	.06	11	1,365	12.5
1962	35	2	.06	2	250	12.5
1963	81	5	.06	5	638	12.3
1964	237	16	.07	16	1,888	11.5
<u>5. Netherlands</u>						
1953	99	5	.05	5	631	12.5
1954	85	5	.06	5	600	12.5
1955	211	11	.05	11	1,435	12.5
1956	182	11	.06	11	1,323	12.5
1957	175	10	.06	10	1,280	12.5
1958	66	3	.05	3	414	12.5
1959	206	11	.05	11	1,338	12.5
1960	666	41	.06	41	5,183	12.5
1961	329	21	.06	21	2,636	12.5
1962	763	54	.07	54	6,663	12.4
1963	304	21	.07	21	2,624	12.4
1964	454	30	.07	30	3,722	12.4

(a) Prior to 1962 was s.c. 8186; beginning in 1964 renumbered as s.c. 427-62

Imports: Titanium dioxide, extended, s.c. 8953^(a)

Tariff Item 242

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
				(000)		
<u>1. Total</u>						
1962	24,647	2,355	.10	2,351	293,866	12.5
1963	18,638	1,786	.10	1,786	223,224	12.5
1964	20,887	2,000	.10	1,996	249,469	12.5
<u>2. United States</u>						
1962	24,647	2,355	.10	2,351	293,866	12.5
1963	18,638	1,786	.10	1,786	223,224	12.5
1964	20,887	2,000	.10	1,996	249,469	12.5

(a) Prior to 1962 included in s.c. 8181; beginning in 1964 renumbered as s.c. 427-72

Table 36

Imports: Orange and yellow pigments, s.c. 8941 ^(a)

Tariff Items 246, 246d and 247

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	827	861	1.04	700	122,020	17.4
1963	1,078	1,110	1.03	854	150,173	17.6
1964	1,056	1,036	.98	760	133,985	17.6
<u>2. United Kingdom</u>						
1962	76	92	1.21	69	8,742	12.7
1963	78	146	1.86	89	11,230	12.6
1964	56	95	1.71	52	6,536	12.6
<u>3. United States</u>						
1962	689	731	1.06	597	107,381	18.0
1963	874	896	1.03	707	128,703	18.2
1964	971	892	.92	661	119,322	18.0
<u>4. Germany, Fed. Rep. of</u>						
1962	6	18	2.85	15	2,592	17.5
1963	75	45	.59	41	7,270	17.5
1964	16	27	1.76	26	4,606	17.4
<u>5. Switzerland</u>						
1962	1	2	1.73	2	288	17.0
1963	4	11	2.41	5	859	17.2
1964	9	17	1.95	15	2,541	17.3

(a) Prior to 1962 included in s.c. 8092, 8189 and 8213; beginning in 1964 renumbered as s.c. 427-09

Table 37

Imports: Blue and green pigments, s.c. 8945^(a)

Tariff Items 240, 246 246d and 247

Year	Total Imports		Unit Value	Dutiable Value	Duty Collected	Duty as p.c. of Dutiable Value
	lb. (000)	\$ (000)	\$/lb.	\$ (000)	\$	
<u>1. Total</u>						
1962	1,994	1,876	.94	1,636	276,485	16.9
1963	2,207	2,094	.95	1,799	302,638	16.8
1964	1,982	2,012	1.01	1,648	274,554	16.7
<u>2. United Kingdom</u>						
1962	669	298	.45	214	26,729	12.5
1963	637	367	.58	273	34,274	12.5
1964	603	382	.63	296	37,723	12.7
<u>3. United States</u>						
1962	1,094	1,426	1.30	1,291	228,867	17.7
1963	1,234	1,525	1.24	1,330	237,886	17.9
1964	1,112	1,448	1.30	1,180	209,369	17.7
<u>4. Australia</u>						
1962	146	50	.34	40	4,954	12.5
1963	210	76	.36	76	9,453	12.5
1964	150	54	.36	54	6,733	12.5
<u>5. Germany, Fed. Rep. of</u>						
1962	23	35	1.49	33	5,808	17.5
1963	41	57	1.39	56	9,786	17.4
1964	25	36	1.44	34	5,977	17.8
<u>6. Switzerland</u>						
1962	13	31	2.43	25	4,366	17.3
1963	16	37	2.24	32	5,528	17.2
1964	17	35	2.07	28	4,799	17.1

(a) Prior to 1962 included in s.c. 8092, 8189, 8192 and 8213; beginning in 1964 renumbered as s.c. 427-28

Table 38

Imports: Red and maroon pigments, s.c. 8947^(a)

Tariff Items 246, 246d and 247

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	778	1,720	2.21	1,444	250,499	17.3
1963	869	2,139	2.46	1,718	301,167	17.5
1964	749	2,068	2.76	1,609	280,570	17.4
<u>2. United Kingdom</u>						
1962	93	139	1.50	106	13,424	12.7
1963	93	143	1.54	108	13,677	12.7
1964	74	135	1.81	80	10,097	12.6
<u>3. United States</u>						
1962	570	1,480	2.60	1,244	220,483	17.7
1963	700	1,903	2.72	1,532	273,684	17.9
1964	601	1,857	3.09	1,464	259,113	17.7
<u>4. Germany, Fed. Rep. of</u>						
1962	94	82	.87	78	13,577	17.5
1963	48	65	1.33	54	9,451	17.6
1964	58	59	1.02	50	8,730	17.5
<u>5. Switzerland</u>						
1962	1	2	1.72	1	151	19.5
1963	4	9	2.51	6	996	17.2
1964	2	8	3.41	5	918	17.4

(a) Prior to 1962 included in s.c. 8092, 8189 and 8213; beginning in 1964 renumbered as s.c. 427-39

Table 39

Imports: Ultramarine blue, dry or in pulp, s.c. 8192^(a)

Tariff Item 240

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	722	153	.21	79	7,896	10.0
1954	691	146	.21	60	5,982	10.0
1955	805	154	.19	68	6,847	10.0
1956	486	110	.23	52	5,211	10.0
1957	410	92	.22	41	4,051	10.0
1958	471	105	.22	35	3,536	10.0
1959	535	116	.22	40	3,978	10.0
1960	412	86	.21	30	3,051	10.2
1961	447	108	.24	38	3,856	10.2
<u>2. United Kingdom</u>						
1953	384	73	.19	-	-	-
1954	457	84	.18	-	-	-
1955	467	82	.18	-	-	-
1956	293	56	.19	-	-	-
1957	255	50	.19	-	-	-
1958	335	67	.20	-	-	-
1959	388	74	.19	-	-	-
1960	274	52	.19	-	-	-
1961	300	67	.22	1	144	12.5
<u>3. United States</u>						
1953	338	80	.24	79	7,857	10.0
1954	229	60	.26	59	5,898	10.0
1955	291	69	.24	67	6,653	10.0
1956	194	54	.28	52	5,211	10.0
1957	154	42	.27	40	4,029	10.0
1958	135	38	.28	35	3,529	10.0
1959	142	40	.28	38	3,849	10.0
1960	138	34	.25	30	3,051	10.2
1961	147	41	.28	37	3,712	10.1

(a) Beginning in 1962 included in s.c. 8945

Imports: Luminescent, fluorescent or phosphorescent agents for
paints, n.o.p., s.c. 8957(a)

Tariff Items 208p, 246, 246e, 220a(i) and 220d

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	343	1,174	3.43	1,154	112,909	9.8
1963	431	1,424	3.30	1,314	73,229	5.6
1964	491	1,617	3.30	1,458	76,236	5.2
<u>2. United States</u>						
1962	343	1,173	3.42	1,154	112,885	9.8
1963	427	1,416	3.31	1,309	72,527	5.5
1964	490	1,616	3.30	1,458	76,236	5.2

(a) Prior to 1962 included in s.c. 8189, 8378, 8415 and 8437;
beginning in 1964 renumbered as s.c. 427-92

Imports: Fluorescent coating or powder, s.c. 8437^(a)

Tariff Items 220a(i) and 220d

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	Duty as p.c. of Dutiable Value
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$ (000)	\$	
<u>1. Total</u>						
1953	76	313	4.12	313	17,685	5.6
1954	75	337	4.47	337	17,965	5.3
1955	88	390	4.41	390	20,512	5.3
1956	106	540	5.09	537	28,383	5.3
1957	111	430	3.88	422	24,408	5.8
1958	105	449	4.29	448	24,136	5.4
1959	144	583	4.04	582	47,261	8.1
1960	235	827	3.52	821	97,071	11.8
1961	271	892	3.29	892	102,869	11.5
<u>2. United States</u>						
1953	76	311	4.11	311	17,576	5.7
1954	75	337	4.47	337	17,965	5.3
1955	88	390	4.41	390	20,512	5.3
1956	106	540	5.09	537	28,383	5.3
1957	110	423	3.84	422	24,408	5.8
1958	104	447	4.29	447	24,085	5.4
1959	144	581	4.04	581	47,170	8.1
1960	235	826	3.52	821	97,071	11.8
1961	271	892	3.29	892	102,869	11.5

^(a) Beginning in 1962 included in s.c. 8957

Table 42

Imports: Blueing, laundry, s.c. 8393 (a)

Tariff Item 246

<u>Year</u>	<u>Total Imports</u> \$(000)	<u>Dutiable Value</u> \$(000)	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>1. Total</u>				
1953	15	15	2,601	17.5
1954	10	10	1,765	17.5
1955	7	7	1,211	17.5
1956	29	29	3,958	13.9
1957	89	89	12,663	14.2
1958	77	77	10,592	13.7
1959	50	50	6,939	13.8
1960	63	63	9,107	14.5
1961	67	67	9,321	14.0
<u>2. United Kingdom</u>				
1953	*	*	10	11.9
1954	-	-	-	-
1955	-	-	-	-
1956	21	21	2,574	12.5
1957	59	59	7,412	12.5
1958	58	58	7,289	12.5
1959	37	37	4,683	12.5
1960	38	38	4,789	12.5
1961	47	47	5,869	12.5
<u>3. United States</u>				
1953	15	15	2,591	17.5
1954	10	10	1,765	17.5
1955	7	7	1,211	17.5
1956	8	8	1,384	17.5
1957	30	30	5,251	17.5
1958	19	19	3,303	17.5
1959	13	13	2,256	17.6
1960	25	25	4,318	17.6
1961	20	20	3,452	17.6

(a) Beginning in 1962 included in s.c. 8249 "Household chemicals specialties, n.o.p."

Imports: Oxides, fireproofs, rough stuff, fillers and colours,
dry, n.o.p., s.c. 8189(a)

Tariff Items 246 and 246d^(b)

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	10,516	3,869	.37	3,740	633,206	16.9
1954	8,887	3,238	.36	3,143	530,225	16.9
1955	11,414	3,832	.34	3,693	626,174	17.0
1956	12,474	3,601	.29	3,352	568,820	17.0
1957	9,652	3,352	.35	3,183	537,340	16.9
1958	9,845	3,375	.34	3,170	535,316	16.9
1959	12,205	4,283	.35	3,966	672,435	17.0
1960	9,816	4,037	.41	3,730	627,953	16.8
1961	9,807	4,299	.44	3,939	668,343	17.0
<u>2. United Kingdom</u>						
1953	1,082	429	.40	427	53,368	12.5
1954	1,063	401	.38	397	49,570	12.5
1955	1,391	404	.29	401	50,185	12.5
1956	1,215	374	.31	360	45,041	12.5
1957	1,308	391	.30	391	48,937	12.5
1958	1,612	394	.25	389	48,590	12.5
1959	1,804	453	.25	437	54,685	12.5
1960	1,554	454	.29	426	53,245	12.5
1961	1,235	487	.40	433	54,362	12.6

Table 43
(Cont'd)

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
3. United States						
1953	8,683	3,359	.39	3,232	565,588	17.5
1954	6,865	2,741	.40	2,650	463,747	17.5
1955	8,221	3,383	.40	3,147	550,660	17.5
1956	9,590	3,091	.32	2,855	499,870	17.5
1957	6,617	2,807	.42	2,638	461,670	17.5
1958	6,616	2,786	.42	2,590	453,167	17.5
1959	8,057	3,439	.43	3,144	550,368	17.5
1960	6,716	3,328	.50	3,052	530,708	17.4
1961	6,783	3,477	.51	3,172	555,561	17.5
4. Germany, Fed. Rep. of						
1953	534	42	.08	42	7,318	17.5
1954	572	56	.10	56	9,780	17.5
1955	1,306	73	.06	73	12,856	17.5
1956	1,205	89	.07	89	15,569	17.5
1957	1,191	87	.07	87	15,246	17.5
1958	1,235	91	.07	91	16,000	17.5
1959	1,586	178	.11	178	31,065	17.5
1960	985	113	.11	113	19,829	17.5
1961	1,188	206	.17	205	35,924	17.5

(a) Beginning in 1962 included in s.c. 8199, 8941, 8945, 8947, 8957, 8959, 8975, 8979 and 8989

(b) Tariff Item 246d is included to June 1961 only

Table 44

Imports: Ochres, ochrey earths, siennas and umbers, s.c. 8201 ^(a)

Tariff Item 245

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	2,342	72	.03	71	8,380	11.7
1954	2,105	61	.03	61	7,246	11.8
1955	1,971	66	.03	66	7,921	12.0
1956	2,324	91	.04	91	11,117	12.3
1957	1,891	75	.04	75	9,080	12.1
1958	1,360	58	.04	58	7,025	12.2
1959	1,665	79	.05	78	9,647	12.3
1960	1,230	63	.05	63	7,776	12.2
1961	1,299	65	.05	65	7,726	11.9
<u>2. United Kingdom</u>						
1953	255	7	.03	7	367	5.0
1954	211	6	.03	6	288	5.0
1955	171	4	.02	4	209	5.0
1956	91	3	.03	3	152	5.3
1957	139	4	.03	4	222	5.0
1958	54	2	.04	2	112	5.0
1959	58	2	.04	2	102	5.0
1960	60	2	.04	2	119	5.1
1961	95	4	.04	4	203	5.0
<u>3. United States</u>						
1953	2,035	63	.03	63	7,842	12.5
1954	1,894	56	.03	56	6,958	12.5
1955	1,760	61	.03	61	7,588	12.5
1956	2,191	87	.04	87	10,837	12.5
1957	1,673	65	.04	65	8,097	12.5
1958	1,284	55	.04	55	6,851	12.5
1959	1,567	76	.05	75	9,373	12.5
1960	1,144	60	.05	60	7,574	12.5
1961	1,148	60	.05	60	7,383	12.3

(a) Beginning in 1962 included in s.c. 8959

Imports: Ceramic, enamelling and glass paints, s.c. 8975^(a)

Tariff Items 220a(i), 246, 246b, 246c, 247, 249, 251 and 711

<u>Year</u>	<u>Total Imports</u> \$ (000)	<u>Dutiable Value</u> \$ (000)	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>1. Total</u>				
1962	1,365	788	167,245	21.2
1963	1,648	974	192,855	19.8
1964	1,783	1,152	214,695	18.6
<u>2. United Kingdom</u>				
1962	213	47	8,077	17.1
1963	304	49	6,407	13.0
1964	291	87	9,881	11.3
<u>3. United States</u>				
1962	1,150	739	158,709	21.5
1963	1,336	916	184,819	20.2
1964	1,489	1,062	204,190	19.2

(a) Prior to 1962 included in s.c. 7301, 8189, 8213, 8215, 8216 and 8415; beginning in 1964 renumbered as s.c. 428-33

Table 46

Imports: Stains and oxides, valued at not less than 20 cents per pound, for use as colouring constituents in the manufacture of vitreous enamels and pottery glazes; finely divided metals or compounds of metals, whether dry or suspended or dissolved in a liquid, for the manufacture of glassware and of tableware of china, porcelain or semi-porcelain, s.c. 8215^(a)

Tariff Items 246b and 246c

Year	Total Imports		Unit Value	Dutiable Value	Duty Collected	Duty as p.c. of Dutiable Value
	lb. (000)	\$ (000)	\$/lb.	\$ (000)	\$	
<u>1. Total</u>						
1953	387	357	.92	40	8,030	20.0
1954	311	311	1.00	35	7,002	20.0
1955	364	368	1.01	56	11,129	20.0
1956	373	386	1.03	63	12,508	20.0
1957	352	342	.97	48	9,524	20.0
1958	564	488	.87	98	19,578	20.0
1959	733	509	.70	71	14,122	20.0
1960	530	414	.78	43	8,567	20.0
1961	893	590	.66	44	8,742	20.0
<u>2. United Kingdom</u>						
1953	21	23	1.10	-	-	-
1954	16	24	1.48	-	-	-
1955	49	35	.72	-	-	-
1956	19	29	1.57	-	-	-
1957	25	27	1.08	-	-	-
1958	241	66	.27	-	-	-
1959	337	87	.26	-	-	-
1960	222	64	.29	-	-	-
1961	525	140	.27	-	-	-
<u>3. United States</u>						
1953	363	316	.87	40	8,030	20.0
1954	294	276	.94	35	7,002	20.0
1955	315	326	1.04	55	11,097	20.0
1956	355	357	1.01	63	12,508	20.0
1957	326	314	.96	47	9,495	20.0
1958	322	422	1.31	98	19,578	20.0
1959	396	422	1.07	70	14,092	20.0
1960	307	347	1.13	43	8,540	20.0
1961	366	443	1.21	43	8,521	20.0

(a) Beginning in 1962 included in s.c. 8975

Imports: Varnishes and prepared shellacs, s.c. 8981^(a)

Tariff Items 248 and 249

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>gal.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/gal.	\$	\$	
				(000)		
<u>1. Total</u>						
1962	183	799	4.37	782	153,973	19.7
1963	167	719	4.31	695	136,273	19.6
1964	155	660	4.25	641	112,831	17.6
<u>2. United Kingdom</u>						
1962	4	26	7.20	26	2,707	10.3
1963	3	26	8.00	26	1,961	7.5
1964	3	23	7.98	23	1,593	7.0
<u>3. United States</u>						
1962	177	762	4.31	745	149,148	20.0
1963	158	666	4.20	642	129,608	20.2
1964	150	620	4.15	601	108,837	18.1

(a) Prior to 1962 included in s.c. 8214 and 8216;
beginning in 1964 renumbered as s.c. 428-40

Table 48

Imports: Lacquers, s.c. 8983^(a)

Tariff Items 247, 248 and 249

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>gal.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/gal.	\$	\$	
				(000)		
	<u>1. Total</u>					
1962	272	1,525	5.61	1,525	290,604	19.1
1963	263	1,451	5.52	1,449	254,392	17.6
1964	261	1,425	5.46	1,423	236,744	16.6
	<u>2. United Kingdom</u>					
1962	*	3	8.67	3	272	8.1
1963	*	1	7.77	1	103	8.4
1964	*	3	11.80	3	172	6.1
	<u>3. United States</u>					
1962	267	1,491	5.58	1,491	285,432	19.1
1963	259	1,425	5.50	1,423	250,620	17.6
1964	251	1,393	5.56	1,392	232,403	16.7

(a) Prior to 1962 included in s.c. 8213, 8214 and 8216;
beginning in 1964 renumbered as s.c. 428-59

Table 49

Imports: Paste paints, including white lead and paint colours in oil,
s.c. 8971(a)

Tariff Items 220a(i), 244, 247 and 711

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1962	508	219	.43	216	44,990	20.9
1963	679	175	.26	171	34,519	20.2
1964	559	251	.45	250	48,543	19.5
<u>2. United Kingdom</u>						
1963	1	*	.44	*	70	15.8
1964	12	1	.10	1	184	15.3
<u>3. United States</u>						
1962	506	217	.43	214	44,643	20.8
1963	676	173	.26	169	34,092	20.2
1964	544	247	.45	245	47,763	19.5

(a) Prior to 1962 included in s.c. 8173, 8213 and 8415;
beginning in 1964 renumbered as s.c. 428-16

Imports: Paints, n.o.p., s.c. 8973^(a)

Tariff Items 220a(i), 247, 248 and 251

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>gal.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/gal.	\$	\$	
				(000)		
			<u>1. Total</u>			
1962	430	2,223	5.17	2,210	486,822	22.0
1963	458	2,258	4.93	2,251	463,523	20.6
1964	441	2,309	5.24	2,265	440,822	19.5
			<u>2. United Kingdom</u>			
1962	13	55	4.31	55	10,217	18.6
1963	12	55	4.71	55	9,037	16.4
1964	13	69	5.32	69	10,537	15.2
			<u>3. United States</u>			
1962	416	2,164	5.21	2,151	475,790	22.1
1963	445	2,193	4.93	2,186	452,992	20.7
1964	424	2,223	5.25	2,178	427,724	19.6

(a) Prior to 1962 included in s.c. 8213, 8214 and 8415;
beginning in 1964 renumbered as s.c. 428-29

Imports: Special purpose paints, n.o.p., s.c. 8979^(a)

Tariff Items 246, 247, 247b and 248

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>gal.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/gal.	\$	\$	
				(000)		
			<u>1. Total</u>			
1962	240	979	4.07	954	202,388	21.2
1963	230	904	3.93	893	178,828	20.0
1964	283	1,092	3.85	912	169,953	18.6
			<u>2. United Kingdom</u>			
1962	15	48	3.27	48	8,582	17.8
1963	10	43	4.19	43	6,885	16.1
1964	9	51	5.65	51	7,866	15.6
			<u>3. United States</u>			
1962	225	901	4.00	877	192,786	22.0
1963	217	833	3.84	823	167,790	20.4
1964	273	1,019	3.73	838	160,827	19.2

(a) Prior to 1962 included in s.c. 8189, 8213 and 8214;
beginning in 1964 renumbered as s.c. 428-37

Imports: Paints and colours, ground in spirits, and all spirit
varnishes and lacquers, s.c. 8214^(a)

Tariff Item 248

Year	Total Imports		Unit Value	Dutiable Value	Duty Collected	Duty as p.c. of Dutiable Value
	gal. (000)	\$	\$/gal.	\$ (000)	\$	
<u>1. Total</u>						
1953	66	290	4.37	290	56,340	19.4
1954	62	272	4.37	272	52,653	19.4
1955	76	343	4.52	343	64,261	18.7
1956	78	369	4.72	369	66,339	18.0
1957	88	436	4.93	436	75,011	17.2
1958	94	508	5.43	508	79,367	15.6
1959	103	600	5.82	599	87,881	14.7
1960	128	740	5.77	740	109,249	14.8
1961	122	796	6.53	796	103,365	13.0
<u>2. United Kingdom</u>						
1953	1	9	8.52	9	827	8.8
1954	2	16	7.06	16	1,686	10.5
1955	2	10	5.86	10	1,287	12.8
1956	2	12	6.95	12	1,333	10.8
1957	2	14	7.70	14	1,370	9.8
1958	1	10	7.86	10	991	9.6
1959	1	11	11.46	11	691	6.4
1960	1	14	9.66	14	1,113	7.7
1961	1	15	12.34	15	911	5.9
<u>3. United States</u>						
1953	65	276	4.26	276	55,042	19.9
1954	59	251	4.24	251	50,460	20.1
1955	72	312	4.35	312	60,914	19.5
1956	73	336	4.58	336	62,396	18.6
1957	82	391	4.79	391	69,398	17.8
1958	88	472	5.35	472	75,033	15.9
1959	98	562	5.74	561	83,553	14.9
1960	118	672	5.67	672	101,007	15.0
1961	116	751	6.47	751	98,595	13.1

(a) Beginning in 1962 included in s.c. 8973, 8979, 8981 and 8983

Table 53

Imports: Varnish, lacquers, japans, japan driers, liquid driers, and oil finish, n.o.p., s.c. 8216^(a)

Tariff Item 249

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	gal. (000)	\$ (000)	Value \$/gal.	Value \$ (000)	Collected \$	p.c. of Dutiable Value
<u>1. Total</u>						
1953	152	509	3.35	509	96,992	19.1
1954	230	676	2.94	674	133,377	19.8
1955	306	798	2.61	797	164,124	20.6
1956	330	845	2.56	844	174,776	20.7
1957	298	835	2.80	834	168,749	20.2
1958	304	965	3.17	964	188,426	19.5
1959	287	993	3.46	991	189,910	19.2
1960	299	1,110	3.71	1,108	208,077	18.8
1961	377	1,474	3.91	1,455	270,557	18.6
<u>2. United Kingdom</u>						
1953	5	16	3.27	16	1,531	9.6
1954	7	22	3.22	22	2,172	9.8
1955	3	12	3.94	12	1,065	8.8
1956	3	14	4.50	14	1,199	8.3
1957	3	10	4.11	10	896	8.6
1958	4	18	4.58	18	1,452	8.3
1959	4	17	4.83	17	1,385	8.1
1960	5	34	6.21	34	2,495	7.4
1961	8	36	4.47	36	3,023	8.3
<u>3. United States</u>						
1953	146	490	3.35	490	94,892	19.4
1954	221	645	2.91	643	129,662	20.2
1955	301	779	2.59	777	161,682	20.8
1956	326	826	2.53	826	172,876	20.9
1957	294	821	2.79	820	167,126	20.4
1958	298	939	3.15	938	185,449	19.8
1959	281	969	3.44	967	187,173	19.4
1960	291	1,066	3.66	1,063	203,612	19.1
1961	367	1,430	3.90	1,411	266,154	18.9

(a) Beginning in 1962 included in s.c. 8975, 8981, 8983 and 8989

Table 54

Imports: Gold liquid paint, s.c. 8212^(a)

Tariff Item 251

<u>Year</u>	<u>Total Imports</u> \$	<u>Dutiable Value</u> \$	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>1. Total</u>				
1953	7,542	7,542	1,692	22.4
1954	5,453	5,453	1,227	22.5
1955	7,408	7,279	1,638	22.5
1956	7,200	7,200	1,620	22.5
1957	8,895	8,895	2,001	22.5
<u>2. United Kingdom</u>				
1953	58	58	8	13.8
1954-57	-	-	-	-
<u>3. United States</u>				
1953	7,484	7,484	1,684	22.5
1954	5,453	5,453	1,227	22.5
1955	7,408	7,279	1,638	22.5
1956	7,200	7,200	1,620	22.5
1957	8,895	8,895	2,001	22.5

^(a) Beginning in 1958 included in s.c. 8213

Imports: Artists' and school children's colours; fitted boxes containing the same; pastels, of a value of one cent per stick or over, s.c. 8211(a)

Tariff Items 247a(1) and 247a(2)

<u>Year</u>	<u>Total Imports</u> \$ (000)	<u>Dutiable Value</u> \$ (000)	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>1. Total</u>				
1953	593	362	54,935	15.2
1954	650	407	61,969	15.2
1955	575	303	45,999	15.2
1956	676	329	50,095	15.2
1957	715	394	60,135	15.2
1958	791	460	70,357	15.3
1959	1,056	658	100,323	15.3
1960	1,089	681	103,853	15.2
1961	1,242	690	105,738	15.3
1962	1,123	904	136,866	15.1
1963	1,237	807	126,922	15.7
1964	1,190	746	115,327	15.5
<u>2. United Kingdom</u>				
1953	231	-	-	-
1954	243	-	-	-
1955	272	-	-	-
1956	347	-	-	-
1957	320	-	-	-
1958	331	*	26	17.7
1959	399	-	-	-
1960	408	-	-	-
1961	553	-	-	-
1962	443	224	11,192	5.0
1963	486	56	2,801	5.0
1964	443	2	487	28.2

<u>Year</u>	<u>Total Imports</u> \$ (000)	<u>Dutiable Value</u> \$ (000)	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>3. United States</u>				
1953	351	351	53,143	15.1
1954	397	397	60,398	15.2
1955	293	293	44,375	15.1
1956	311	311	47,081	15.2
1957	375	375	57,074	15.2
1958	438	438	66,862	15.3
1959	616	616	93,575	15.2
1960	633	633	95,940	15.2
1961	622	622	95,006	15.3
1962	608	608	110,656	18.2
1963	663	662	108,778	16.4
1964	674	671	103,917	15.5

(a) 1964 includes only data entering under tariff item 247a(1),
s.c. 905-08 "Artists' and students' paints, oils and varnishes"

Table 56

Imports: Stains, thinners, fillers and related products, n.o.p.,
s.c. 8989^(a)

Tariff Items 220a(i), 246, 247, 249, 253, 269(i), 269(ii), and 711

<u>Year</u>	<u>Total Imports</u> \$ (000)	<u>Dutiable Value</u> \$ (000)	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>1. Total</u>				
1962	930	923	187,784	20.3
1963	1,040	961	185,641	19.3
1964	1,643	1,615	294,191	18.2
<u>2. United Kingdom</u>				
1962	15	11	1,798	15.7
1963	22	22	2,768	12.7
1964	45	42	5,809	13.7
<u>3. United States</u>				
1962	911	908	185,250	20.4
1963	1,012	934	181,665	19.5
1964	1,549	1,523	280,127	18.4

(a) Prior to 1962, included in s.c. 7185, 8189, 8202, 8216 and 8415; beginning in 1964 renumbered as s.c. 428-99, which excludes caulking compounds of s.c. 429-95 shown below

Table 57

Imports: Caulking, sealing and sound deadening compounds, s.c. 429-95^(a)

Tariff Items 208t, 220a(i), 312a, 618, 711 and 904

Year	Total Imports		Unit Value	Dutiable Value	Duty Collected	Duty as p.c. of Dutiable Value
	lb.	\$	\$/lb.	\$	\$	
	(000)	(000)		(000)		
<u>1. Total</u>						
1964	15,155	2,386	.16	2,299	447,126	19.4
<u>2. United Kingdom</u>						
1964	295	85	.29	16	2,278	14.3
<u>3. United States</u>						
1964	14,802	2,241	.15	2,227	436,051	19.6

(a) Prior to 1964, included in: s.c. 1730, "Weatherstripping of rubber"; s.c. 7301; "Non-metallic mineral and bituminous substances, n.o.p."; s.c. 8415, "Other chemicals and allied products, n.o.p."; and s.c. 8989 above

Imports: Putty, s.c. 8202^(a)

Tariff Item 253

Year	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	Duty as p.c. of Dutiable Value
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
				(000)		
<u>1. Total</u>						
1953	347	48	.14	48	10,644	22.3
1954	421	60	.14	60	13,533	22.5
1955	802	92	.11	92	20,510	22.4
1956	786	127	.16	127	28,468	22.5
1957	839	129	.15	129	28,978	22.5
1958	1,081	162	.15	162	36,272	22.4
1959	998	165	.17	165	36,783	22.3
1960	633	142	.22	142	31,631	22.2
1961	605	165	.27	165	36,776	22.2
<u>2. United Kingdom</u>						
1953	58	1	.02	1	163	15.7
1954	4	*	.11	*	75	15.7
1955	14	1	.10	1	217	15.8
1956	10	1	.07	1	105	15.6
1957	9	1	.09	1	122	15.8
1958	10	1	.13	1	209	15.7
1959	24	2	.08	2	309	15.7
1960	13	2	.19	2	386	15.8
1961	7	2	.27	2	286	15.9
<u>3. United States</u>						
1953	290	47	.16	47	10,481	22.5
1954	416	60	.14	60	13,458	22.5
1955	672	87	.13	87	19,641	22.5
1956	776	126	.16	126	28,339	22.5
1957	830	128	.15	128	28,842	22.5
1958	1,070	160	.15	160	36,063	22.5
1959	970	163	.17	162	36,429	22.4
1960	617	140	.23	140	31,218	22.3
1961	591	161	.27	161	35,987	22.3

(a) Beginning in 1962 included in s.c. 8415 and 8989

Imports: Liquid fillers, anti-corrosive and anti-fouling paints,
and ground and liquid paints, n.o.p., s.c. 8213^(a)

Tariff Items 247, 247b and 251

Year	Total Imports		Unit Value	Dutiable Value	Duty Collected	Duty as p.c. of Dutiable Value
	gal. (000)	\$ (000)	\$/gal.	\$ (000)	\$	
<u>1. Total</u>						
1953	509	1,653	3.24	1,612	320,934	19.9
1954	519	1,751	3.37	1,725	342,624	19.9
1955	605	2,174	3.59	2,147	426,255	19.9
1956	749	2,697	3.60	2,674	531,717	19.9
1957	630	2,417	3.84	2,408	479,047	19.9
1958	703	2,994	4.26	2,965	590,992	19.9
1959	725	3,019	4.17	2,982	592,876	19.9
1960	733	3,210	4.38	3,175	631,768	19.9
1961	698	3,334	4.77	3,305	655,802	19.8
<u>2. United Kingdom</u>						
1953	11	33	2.86	32	5,114	15.8
1954	18	59	3.21	55	8,727	15.8
1955	21	74	3.55	71	11,242	15.8
1956	19	70	3.63	70	10,996	15.8
1957	14	58	4.04	58	9,200	15.8
1958	25	52	2.05	52	8,131	15.7
1959	13	57	4.38	56	8,910	15.8
1960	15	59	3.92	59	9,372	15.8
1961	13	53	4.22	51	7,984	15.7
<u>3. United States</u>						
1953	498	1,619	3.25	1,578	315,531	20.0
1954	500	1,690	3.38	1,667	333,320	20.0
1955	581	2,086	3.59	2,061	412,226	20.0
1956	724	2,606	3.60	2,583	516,638	20.0
1957	611	2,341	3.83	2,332	466,403	20.0
1958	673	2,927	4.35	2,897	579,806	20.0
1959	707	2,941	4.16	2,904	579,809	20.0
1960	707	3,120	4.41	3,089	617,116	20.0
1961	682	3,255	4.77	3,229	644,582	20.0

(a) Beginning in 1958 includes former s.c. 8212;
beginning in 1962 included in various statistical classes

(a)

Imports: Ink, printing, s.c. 8405

Tariff Items 256 and 203d

<u>Year</u>	<u>Total Imports</u>		<u>Unit Value</u>	<u>Dutiable Value</u>	<u>Duty Collected</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>\$/lb.</u>	<u>\$</u>	<u>\$</u>	
	(000)	(000)		(000)		
<u>1. Total</u>						
1953	1,674	986	.59	986	143,980	14.6
1954	1,941	921	.47	921	132,983	14.4
1955	1,828	1,009	.55	1,009	145,776	14.5
1956	1,842	1,006	.55	1,006	146,113	14.5
1957	2,345	1,178	.50	1,178	170,187	14.4
1958	2,184	1,169	.54	1,169	170,040	14.5
1959	2,314	1,255	.54	1,255	180,683	14.4
1960	2,688	1,472	.55	1,472	213,916	14.5
1961	2,790	1,637	.59	1,636	238,523	14.6
1962	2,887	1,719	.60	1,718	250,789	14.6
1963	2,741	1,558	.57	1,557	224,463	14.4
1964	3,102	1,699	.55	1,553	224,410	14.4
<u>2. United Kingdom</u>						
1953	315	156	.49	156	19,466	12.5
1954	458	207	.45	207	25,827	12.5
1955	479	224	.47	224	28,051	12.5
1956	398	191	.48	191	23,904	12.5
1957	568	261	.46	261	32,676	12.5
1958	441	212	.48	212	26,552	12.5
1959	666	315	.47	315	39,358	12.5
1960	645	305	.47	305	38,086	12.5
1961	712	329	.46	329	41,164	12.5
1962	746	372	.50	372	46,837	12.6
1963	804	402	.50	402	50,121	12.5
1964	760	377	.50	375	46,753	12.5

Table 60
(Cont'd)

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>3. United States</u>						
1953	1,356	828	.61	828	124,297	15.0
1954	1,478	711	.48	711	106,650	15.0
1955	1,322	766	.58	766	114,916	15.0
1956	1,401	787	.56	787	118,055	15.0
1957	1,698	870	.51	869	130,424	15.0
1958	1,604	869	.54	869	130,312	15.0
1959	1,511	853	.56	853	128,227	15.0
1960	1,864	1,043	.56	1,043	157,017	15.1
1961	1,868	1,172	.63	1,172	177,071	15.1
1962	1,940	1,184	.61	1,183	178,695	15.1
1963	1,782	1,020	.57	1,020	154,104	15.1
1964	2,219	1,212	.55	1,069	161,457	15.1
<u>4. Germany, Fed. Rep. of</u>						
1953	1	1	.74	1	154	15.1
1954	2	1	.72	1	192	15.0
1955	21	15	.70	15	2,210	15.0
1956	36	22	.63	22	3,337	15.0
1957	58	37	.63	37	5,491	15.0
1958	115	76	.66	76	11,388	15.0
1959	100	67	.66	67	9,998	15.0
1960	138	101	.73	101	15,148	15.0
1961	134	102	.76	102	15,262	15.0
1962	115	101	.87	101	14,967	14.8
1963	72	70	.98	70	10,519	14.9
1964	58	52	.90	52	7,601	14.7

(a) Beginning in 1964 renumbered as s.c. 429-66, "Printing ink" excludes inks other than printing inks classified under s.c. 904-04 (formerly s.c. 8407) and includes textile printing inks formerly classified under s.c. 8415, viz: Drugs, dyes and chemicals n.o.p.

Imports: Ink, rotogravure, s.c. 8406(a)

Tariff Item 256a

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u> <u>Value</u>	<u>Dutiable</u> <u>Value</u>	<u>Duty</u> <u>Collected</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>lb.</u>	<u>\$</u>	<u>\$/lb.</u>	<u>\$</u>	<u>\$</u>	
	(000)	(000)		(000)		
<u>1. Total</u>						
1953	452	87	.19	87	15,154	17.5
1954	587	172	.29	171	29,974	17.5
1955	971	256	.26	256	44,718	17.5
1956	1,102	271	.25	271	47,466	17.5
1957	1,043	267	.26	267	46,727	17.5
1958	1,196	321	.27	321	56,224	17.5
1959	1,649	429	.26	429	75,136	17.5
1960	1,599	438	.27	438	76,631	17.5
1961	1,983	536	.27	536	93,629	17.5
1962	1,895	520	.27	520	90,857	17.5
1963	1,753	478	.27	477	83,485	17.5
1964	1,642	428	.26	428	74,593	17.4
<u>2. United States</u>						
1953	452	87	.19	87	15,154	17.5
1954	585	171	.29	171	29,881	17.5
1955	970	255	.26	255	44,639	17.5
1956	1,102	271	.25	271	47,459	17.5
1957	1,043	267	.26	267	46,727	17.5
1958	1,196	321	.27	321	56,224	17.5
1959	1,649	429	.26	429	75,136	17.5
1960	1,599	438	.27	438	76,631	17.5
1961	1,983	536	.27	536	93,629	17.5
1962	1,895	520	.27	520	90,857	17.5
1963	1,753	478	.27	477	83,485	17.5
1964	1,639	426	.26	426	74,287	17.4

(a) Beginning in 1964 renumbered as s.c. 429-68

Imports: Ink, writing, s.c. 8407(a)

Tariff Items 257 and 256

<u>Year</u>	<u>Total Imports</u> \$ (000)	<u>Dutiable</u> <u>Value</u> \$ (000)	<u>Duty</u> <u>Collected</u> \$	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
<u>1. Total</u>				
1953	71	71	14,022	19.7
1954	84	83	16,555	19.8
1955	103	103	20,388	19.7
1956	107	107	21,098	19.7
1957	130	130	25,861	19.8
1958	138	138	27,330	19.9
1959	157	157	31,166	19.8
1960	165	165	32,898	19.9
1961	199	199	39,531	19.9
1962	234	234	52,720	22.5
1963	159	158	32,720	20.6
1964	249	248	42,797	17.3
<u>2. United Kingdom</u>				
1953	5	5	734	15.0
1954	3	3	398	15.0
1955	5	5	797	15.0
1956	7	7	1,031	15.0
1957	5	5	683	15.0
1958	3	3	520	15.0
1959	2	2	362	15.0
1960	4	4	538	15.0
1961	4	4	664	15.1
1962	3	3	446	16.0
1963	6	6	936	15.1
1964	40	40	5,125	12.8

Table 62
(Cont'd)

<u>Year</u>	<u>Total Imports</u> \$ (000)	<u>Dutiable Value</u> \$ (000)	<u>Duty Collected</u> \$ (000)	<u>Duty as p.c. of Dutiable Value</u>
<u>3. United States</u>				
1953	61	61	12,255	20.0
1954	71	71	14,258	20.0
1955	87	87	17,379	20.0
1956	84	84	16,734	20.0
1957	119	119	23,791	20.0
1958	115	115	22,941	20.0
1959	114	114	22,646	19.9
1960	123	123	24,688	20.0
1961	150	150	29,953	20.0
1962	159	159	35,048	22.1
1963	111	111	23,207	20.9
1964	158	157	28,011	17.8
<u>4. Italy</u>				
1953-57	-	-	-	-
1958	11	11	2,198	20.0
1959	23	23	4,520	19.8
1960	20	20	4,073	20.0
1961	23	23	4,502	20.0
1962	20	20	4,796	24.5
1963	20	20	4,297	21.5
1964	12	12	2,343	20.0
<u>5. Germany, Fed. Rep. of</u>				
1953	5	5	993	20.0
1954	9	9	1,872	20.0
1955	11	11	2,175	20.0
1956	15	15	2,995	20.0
1957	7	7	1,300	20.0
1958	7	7	1,413	20.0
1959	12	12	2,308	20.0
1960	13	13	2,563	20.0
1961	15	15	2,974	20.0
1962	15	15	3,413	23.1
1963	12	12	2,493	20.1
1964	25	25	4,874	19.7

(a) Beginning in 1964 renumbered as s.c. 904-04, "Inks except printing inks". Includes inks other than printing inks formerly classified under s.c. 8405

Table 1

Exports: Dyes and dyestuffs, s.c. 8120^(a)

<u>Year</u>	<u>Value</u> \$
1953	1,409
1954	27,699
1955	46,498
1956	46,228
1957	62,638
1958	64,095
1959	45,055
1960	92,152

(a) Not available after 1960

Table 2

Exports: Pigments, n.o.p., s.c. 8230^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1953	26,250	304,253	11.59
1954	7,034	85,567	12.16
1955	6,473	146,086	22.57
1956	10,982	178,742	16.28
1957	2,306	32,513	14.10
1958	57,347	952,343	16.61
1959	62,474	1,020,071	16.33
1960	29,215	501,204	17.16

(a) Not available after 1960

Table 3

Exports: Dyestuffs, pigments, lakes and toners, s.c. 427-99^(a)

<u>Year</u>	<u>Quantity</u> cwt.	<u>Value</u> \$	<u>Unit</u> <u>Value</u> \$/cwt.
1961	7,018	309,510	44.10
1962	17,976	484,577	26.96
1963	35,647	822,566	23.08
1964	7,048	267,000	37.88
1965	17,802	488,226	27.43

(a) Not available prior to 1961

Table 4

Exports: Enamels and lacquers, s.c. 8250(a)

<u>Year</u>	<u>Value</u> \$ (000)
1953	52
1954	63
1955	64
1956	67
1957	67
1958	46
1959	62
1960	65

(a) Beginning in 1961 included in s.c. 428-35 and 428-99

Table 5

Exports: Paints, n.o.p., s.c. 8260(a)

1953	469
1954	500
1955	492
1956	570
1957	770
1958	859
1959	966
1960	710

(a) Beginning in 1961 included in s.c. 428-35, 428-99, 451-49
452-99 and 900-99

Table 6

Exports: Varnish, 8280(a)

<u>Year</u>	<u>Quantity</u> gal. (000)	<u>Value</u> \$ (000)	<u>Unit</u> <u>Value</u> \$/gal.
1953	11	27	2.55
1954	12	35	2.98
1955	154	293	1.91
1956	328	646	1.97
1957	105	221	2.12
1958	74	177	2.38
1959	67	167	2.52
1960	53	154	2.89

(a) Beginning in 1961 included in s.c. 428-40 and 900-99

Table 7

Exports: Putty, s.c. 8270(a)

<u>Year</u>	<u>Quantity</u> lb. (000)	<u>Value</u> \$ (000)	<u>Unit</u> <u>Value</u> \$/lb.
1953	60	4	.06
1954	23	2	.07
1955	23	2	.06
1956	26	2	.08
1957	4	*	.11
1958	8	1	.16
1959	10	2	.15
1960	55	12	.22

(a) Beginning in 1961 included in s.c. 428-99

Table 8

Exports: Ready-mixed paints, including white lead and colours in oil, s.c. 428-35(a)

<u>Year</u>	<u>Quantity</u> gal. (000)	<u>Value</u> \$ (000)	<u>Unit</u> <u>Value</u> \$/gal.
1961	222	737	3.32
1962	105	473	4.49
1963	125	531	4.23
1964	106	462	4.34

(a) Prior to 1961 included in s.c. 2405, 8240, 8250 and 8260

Table 9

Exports: Shellac and varnishes, s.c. 428-40(a)

<u>Year</u>	<u>Quantity</u> gal. (000)	<u>Value</u> \$ (000)	<u>Unit</u> <u>Value</u> \$/gal.
1961	98	381	3.88
1962	74	189	2.55
1963	40	108	2.74
1964	23	65	2.80

(a) Prior to 1961 included in s.c. 1730 and 8280

Table 10

Exports: Stains, lacquers, thinners, fillers and related products n.e.s., s.c. 428-99^(a)

<u>Year</u>	<u>Value</u> \$ (000)
1961	197
1962	259
1963	224
1964	211

^(a) Prior to 1961 included in s.c. 8080, 8230, 8250, 8260, 8270, 8457 and 8490

Table 11

Exports: Printing ink, s.c. 8444^(a)

<u>Year</u>	<u>Quantity</u> lb.	<u>Value</u> \$	<u>Unit Value</u> \$/lb.
1953	134,810	31,764	.24
1954	56,031	32,706	.58
1955	137,546	39,107	.28
1956	57,354	18,718	.33
1957	117,402	33,825	.29
1958	252,223	42,595	.17
1959	67,687	47,121	.70
1960	200,216	77,165	.39

^(a) Beginning in 1961 included in s.c. 429-99, "Industrial chemical specialties and explosives"

Table 12

Exports: Ink, n.o.p., s.c. 8445^(a)

<u>Year</u>	<u>Value</u> \$
1953	14,571
1954	10,384
1955	28,172
1956	8,151
1957	12,262
1958	34,605
1959	7,584
1960	9,846

^(a) Beginning in 1961 included in 900-99, "Stationers' and office supplies and artists' materials, n.e.s."

APPENDIX IIPrincipal Relevant Recommended Items

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
R-5	203 - Non-edible seeds, beans, nuts, berries, plants, weeds, barks and woods, in a crude state or chipped or ground, when adapted for tanning or dyeing; turmeric and nutgalls; annatto pulp	Free	Free	Free
R-6	*206 - Dragon's blood; fuller's earth, in bulk only, not prepared for toilet or other purposes; litmus and all lichens, prepared or not prepared; musk, in pods or in grain; quassia juice; saffron, saffron cake, safflower; cochineal; ferment cultures to be used in butter-making	Free	Free	Free
R-16	*224 - Sealing wax (including bottle-sealing wax) in sticks, cakes or similar forms	15	22½	25
R-17	240 - Whiting or whitening; natural calcium sulphate, n.o.p.	Free	10	10
R-39	Synthetic wax; waxes containing synthetic wax:			
	(1) Other than the following	15	15	25
	(2) Polyethylene of a weight-average molecular weight not exceeding 5000	Free	Free	10
25.09	Earth colours, whether or not calcined or mixed together; natural micaceous iron oxides	Free	7½	20
28.03	Carbon, n.o.p., including carbon black, anthracene black, acetylene black and lamp black	Free	Free	Free
28.19	Zinc oxide and zinc peroxide	Free	12½	25
28.21	Chromium oxides and hydroxides			
	(1) Other than the following	Free	15	25
	(2) Chromic oxide	10	15	25
	(3) Chromium trioxide	10	15	25

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
28.23	Iron oxides and hydroxides; earth colours containing 70% or more by weight of combined iron evaluated as Fe_2O_3			
	(1) Other than the following	10	15	25
	(2) Iron hydroxides	Free	15	25
28.25	Titanium oxides	Free	12½	25
28.27	Lead oxides; red lead and orange lead:			
	(1) Other than the following	Free	15	25
	(2) Red lead and orange lead	Free	12½	25
28.42	(4) Lead carbonate, basic	10	15	25
28.43	Cyanides and complex cyanides:			
	(1) Other than the following	Free	15	25
	(2) Calcium cyanide	Free	Free	Free
	(3) Potassium cyanide	Free	Free	Free
	(4) Sodium cyanide	Free	Free	Free
	(5) Sodium ferricyanide	Free	Free	Free
	(6) Sodium ferrocyanide	Free	Free	Free
29.07	(4) Phenolsulphonic acids	10	15	25
29.11	(8) Formaldehyde	5	10	20
29.16	(16) Gallic acid	Free	Free	Free
29.22	(2) Aniline	10	15	25
32.01	Tanning extracts of vegetable origin	Free	Free	Free
32.02	Tannins (tannic acids), including water-extracted gall-nut tannin, and their salts, ethers, esters and other derivatives:			
	(1) Tannins (tannic acids) including water-extracted gall-nut tannin	Free	Free	Free
	(2) The salts, ethers, esters and other derivatives of the foregoing	Free	15	25
32.03	Synthetic tanning substances, whether or not mixed with natural tanning materials; artificial bates for pre-tanning (for example, of enzymatic, pancreatic or bacterial origin):			
	(1) Other than the following	Free	Free	Free
	(2) Sodium formaldehyde naphthalene sulphonates	10	15	25

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
32.04	Colouring matter of vegetable origin (including dyewood extract and other vegetable dyeing extracts, but excluding indigo) or of animal origin:			
	(1) Other than the following	Free	Free	Free
	(2) Vegetable materials for use as edible colourings	10	10	25
32.05	Synthetic organic dyestuffs (including pigment dyestuffs); synthetic organic products of a kind used as luminophores; products of the kind known as optical bleaching agents, substantive to the fibre; natural indigo:			
	(1) Other than the following	Free	Free	10
	(2) Phthalocyanine pigment dyestuffs	Free	5	10
	(3) Quinacridone pigment dyestuffs	Free	5	10
	(4) Pigment dyestuffs, other than (2) and (3) above	10	15	25
32.06	Colour lakes	10	15	25
32.07	Other colouring matter; inorganic products of a kind used as luminophores:			
	(1) Other than the following	Free	5	15
	(2) Deleted			
	(3) Black polyethylene masterbatch	5	10	20
	(3A) Inorganic pigments other than those enumerated below in this item	10	15	25
	(4) Inorganic products of a kind used as luminophores	Free	Free	10
	(5) Lithopone	Free	12½	25
	(6) Deleted			
	(7) Titanium whites, not including pure titanium dioxide	Free	12½	25
	(8) Ultramarine	Free	10	15
	(9) Zinc grey	Free	12½	25
32.08	Prepared pigments, prepared opacifiers and prepared colours, vitrifiable enamels and glazes, liquid lustres and similar products, of the kind used in the ceramic, enamelling and glass industries; engobes (slips); glass frit, in the form of powder, granules or flakes, but not other glass	10	15	25

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
32.09	Varnishes and lacquers; distempers, prepared water pigments of the kind used for finishing leather; paints and enamels; pigments in linseed oil, white spirit, spirits of turpentine, varnish or other paint or enamel media; stamping foils; dyes in forms or packings of a kind sold by retail			
	(1) Other than the following	10	15	25
	(2) Pearl essence, natural or synthetic	Free	Free	10
32.10	Artists', students' and signboard painters' colours, modifying tints, amusement colours and the like, in tablets, tubes, jars, bottles, pans or in similar forms or packings, including such colours in sets or outfits, with or without brushes, palettes or other accessories:			
	(1) Other than the following	Free	15	25
	(2) Water colours, in liquid or powder form, in jars, bottles or tins	10	15	25
32.11	Prepared driers	10	15	25
32.12	Glaziers' putty; grafting putty; painters' fillings, and stopping, sealing and similar mastics, including resin mastics and cements:			
	(1) Other than the following	10	15	25
	(2) Mastics based on rubber	15	20	27½
	(3) Sealing wax, n.o.p.	15	22½	25
32.13	Writing ink, printing ink and other inks	10	15	25
38.12	Prepared glazings, prepared dressings and prepared mordants, of a kind used in the textile, paper, leather or like industries:			
	(1) Other than the following	10	15	25
	(2) Preparations of this item having the quality of starch per pound	1¢	1¢	2¢
	(3) Prepared mordants	Free	Free	Free
	(4) Rosin sizing	5	7½	10
38.18	Composite solvents and thinners for varnishes and similar products	10	15	25

CAI FN 55

-57R20



CANADA

Report by
THE TARIFF BOARD

Relative to the Inquiry Ordered
by the Minister of Finance
respecting

CHEMICALS



VOLUME 12

**SURFACTANTS, DETERGENTS AND WASHING PREPARATIONS
IN HEADING 34.02 OF THE BRUSSELS TARIFF
NOMENCLATURE; EXPLOSIVES OF B.T.N.
HEADINGS 36.01 and 36.02**



Reference No. 120

LIBRARY

DEC - 7 1967

UNIVERSITY OF TORONTO



CANADA

Report by
THE TARIFF BOARD

Relative to the Inquiry Ordered
by the Minister of Finance
respecting

CHEMICALS



VOLUME 12

**SURFACTANTS, DETERGENTS AND WASHING PREPARATIONS
IN HEADING 34.02 OF THE BRUSSELS TARIFF
NOMENCLATURE; EXPLOSIVES OF B.T.N.
HEADINGS 36.01 and 36.02**



Reference No. 120

© Crown Copyrights reserved

Available by mail from the Queen's Printer, Ottawa,
and at the following Canadian Government bookshops:

HALIFAX
1735 Barrington Street

MONTREAL
Æterna-Vie Building, 1182 St. Catherine Street West

OTTAWA
Daly Building, Corner Mackenzie and Rideau

TORONTO
221 Yonge Street

WINNIPEG
Mall Center Building, 499 Portage Avenue

VANCOUVER
657 Granville Street

or through your bookseller

Price \$1.50

Catalogue No. FT4-120/12

Price subject to change without notice

ROGER DUHAMEL, F.R.S.C.
Queen's Printer and Controller of Stationery
Ottawa, Canada

1967

THE TARIFF BOARD

L.C. Audette, Q.C.	Chairman
G.H. Glass	First Vice-Chairman
F.L. Corcoran, Q.C.	Second Vice-Chairman
G.A. Elliott	Member
E.C. Gerry	Member
Léo Gervais	Member
A. DeB. McPhillips	Member

J.E. Gander
Director of Research

R.F. Lalonde
Secretary

PANEL FOR THIS INQUIRY

L.C. Audette, Chairman
F.L. Corcoran
G.A. Elliott
Léo Gervais

ECONOMIST

M.S. Islam

The Honourable Mitchell Sharp, P.C., M.P.
Minister of Finance
Ottawa

Dear Mr. Sharp:

I refer to Mr. Harris' letter of September 21, 1956 and to Mr. Fleming's letters of October 11, 1957 and December 21, 1959 in which the Tariff Board was requested to conduct an inquiry respecting chemicals.

In conformity with Section 6 of the Tariff Board Act, I have the honour to transmit Volume 12 of the Report of the Board, in English and in French. This volume contains the report on detergents and explosives in Headings 34.02, 36.01, 36.02 of the Brussels Tariff Nomenclature. Further volumes will be forwarded to you as soon as they have been completed.

Yours sincerely,

A handwritten signature in dark ink, appearing to read "J. C. Cundee". The signature is fluid and cursive, with a long horizontal stroke at the end.

Chairman

Explanation of Symbols Used

- Denotes zero or none reported
- .. Indicates that figures are not available
- * In statistical tables, indicates a reported figure which disappears on rounding, or is negligible
- (a) A small letter in brackets denotes a footnote to a table
- (1) A number in brackets denotes a footnote to the text
- s.c. Denotes a Dominion Bureau of Statistics import or export statistical class

The sum of the figures in a table may differ from the total, owing to rounding

A Note on the Organization of the Report - Reference 120

The first four volumes of the Report by the Tariff Board respecting Reference 120, Chemicals, relate to the reference as a whole; the eleven volumes which follow (Volumes 5 to 15, inclusive) relate to the products which were the subject of the Board's inquiry. The principal subject matter of each of the volumes is given below in terms of the headings of the Brussels Tariff Nomenclature (B.T.N.). Occasionally, chemicals of different B.T.N. headings are dealt with together, for example, chlorine (28.01) and caustic soda (28.17); the more detailed tables of contents of the individual volumes indicate where this occurs.

To the extent that particular statistical tables could be related to specific products or B.T.N. headings they are included in the statistical appendix of the volume which deals with that product or heading. Some tables, which could be related only to broader groupings of chemicals, are included in the statistical appendix to the last volume dealing with such broader groupings: inorganic chemicals in Volume 7, organic chemicals in Volume 9 and artificial resins and plastics in Volume 15.

Because of the unprecedented amplitude and complexity of Reference 120 - Chemicals, many parts of Volumes 5 to 15 were written a considerable time before the first four volumes. This gives rise, occasionally, to apparent discrepancies, attributable to the passage of time, particularly between Volume 4 and those which follow.

Table of Contents for Volumes 1 to 15, inclusive

General Volumes

Volume

1	Recommended Schedule
2	Goods in Recommended Items
3	Goods in Existing Items
4	General Considerations; Summary and Conclusions

Reports on Products

Volume

General Description

B.T.N. Headings

5	Inorganic Chemicals	25.01, 25.03, 28.01 to 28.17, and 28.54
6	Inorganic Chemicals	26.03 and 28.18 to 28.34
7	Inorganic Chemicals	25.32 and 28.35 to 28.58
8	Organic Chemicals	15.10, 15.11, 22.08, 22.09 and 29.01 to 29.13
9	Organic Chemicals	15.10 and 29.14 to 29.45
10	Fertilizers	Chapter 31
11	Dyes, Paints, Inks, Fillers	25.09 and 32.01 to 32.13
12	Detergents; Explosives	34.02, 36.01, 36.02
13	Misc. Chemicals & Preparations	37.08 and 38.02 to 38.19
14	Artificial Resins & Plastics	39.01 and 39.02
15	Artificial Resins & Plastics; Other Portions of Reference 120	39.03 to 39.07 -

Table of Contents of Volume 12*

	<u>Page</u>
Organic Surface-Active Agents; Surface-Active Preparations and Washing Preparations, Whether Or Not Containing Soap - <u>34.02</u>	11
Introduction	11
Surface-Active Agents	12
The Products	12
Raw Materials and the Process of Manufacture	16
The Industry	18
The Canadian Market	25
Foreign Trade	27
Prices and Pricing Policy	30
Transportation	32
Tariff Considerations	33
Surface-Active Preparations and Washing Preparations	46
The Products	46
Raw Materials and the Process of Manufacture	48
The Industry	50
The Canadian Market	56
Foreign Trade	61
Prices and Pricing Policy	64
Transportation	65
Tariff Considerations	67
Prepared Explosives, Including Propellant Powders - <u>36.01 and 36.02</u>	73
The Products and Process of Manufacture	73
The Industry	78
The Canadian Market	81
Foreign Trade	84
Prices and Pricing Policy	87
Transportation	89
Tariff Considerations	91
 Appendices	
I Statistics	103
II Principal Relevant Recommended Items	123
III Lists of Products and Manufacturers	129

* The numbers shown after product designations are those used in the
Brussels Tariff Nomenclature

ORGANIC SURFACE-ACTIVE AGENTS; SURFACE-ACTIVE PREPARATIONS AND
WASHING PREPARATIONS, WHETHER OR NOT CONTAINING SOAP - B.T.N. 34.02

INTRODUCTION

The products of this part of the report are organic surface-active agents, surface-active preparations and washing preparations, whether or not containing soap. B.T.N. heading 34.02 divides these products into two groups, one for surface-active agents (surfactants) and the other for surface-active preparations (detergents) and washing preparations.

Many surfactants, detergents and washing compounds are produced by the same companies and all are used for cleaning purposes in households or industry; the commercial significance, however, differs considerably from one to another. Surfactants, produced from organic chemicals, form the basic raw material for detergents, and are mostly used captively by the producers of detergents. Because of their captive use, data on their production and consumption are not generally available. Detergents, on the other hand, are sold in the market; their production and consumption have witnessed a significant growth in the past two decades. There are other cleaning and washing preparations, such as washing soda, that are made principally from inorganic chemicals such as sodium carbonate; these also are classified in this heading.

The commercial value of all the surface-active agents used in Canada is of the order of \$40 million a year, and that of detergents and washing preparations is about \$100 million.

The products covered by this Reference came up for discussion in three stages at the public hearings. Firstly, a general submission on surfactants was made in May 1961, when some of the individual organic chemicals of Brussels Chapter 29 were before the Board; secondly, in November 1962, when the hearing was confined to surface-active agents of B.T.N. heading 34.02, and lastly in March 1963, when the detergent and other washing preparations formed the subject of hearing. Reference was also made to some materials at a later hearing under B.T.N. heading 38.19. Following the Brussels arrangement, surfactants, the raw materials for the preparations, are considered in the first part below and preparations and washing compounds in the second part.

Soaps, as such, do not form a part of this inquiry. Toilet preparations, which also are an important part of the sales of some of the detergent producers, likewise are not part of this report.

ORGANIC SURFACE-ACTIVE AGENTSThe Products

Surface-active agents are organic compounds of various kinds which, when dissolved in water, alter its surface tension and give the solution greater penetrating, wetting, lathering, emulsifying and detergent power. They consist of single substances and of blends and mixtures which are not chemically defined. As pure organic chemicals, these surfactants are classified in various headings of B.T.N. Chapter 29. However, many of the materials are not chemically defined and, because they are used principally for their surface-active properties and often are specially formulated with these properties in mind, they are regarded as surface-active agents of B.T.N. heading 34.02.

Surface-active agents are divided into four categories depending on their chemical reaction and function: anionic, non-ionic, cationic and amphoteric. These classifications are characterized as follows:⁽¹⁾

Anionics are agents in which the hydrophobic part of the molecule is negatively charged and goes in solution toward the anode. These are almost entirely made up from the sulphate and sulphonate classes such as sulphoricinoleates, sulpho-oleates, sulpho-resinates; water soluble naphthenates and sulphonaphthenates; petroleum sulphonates of alkali metals, of ammonium or of ethanolamine; sulphonation products of fatty alcohols; alkylsulphonates, alkylaryl sulphonates and alkylsulphates, etc. A typical example is alkyl benzene sulphonate. The anionics represent the largest family of surface-active agents and are characterized by their high foaming ability. They are mostly used in household detergents and are generally in the powder form.

Non-ionics, as the name suggests, do not ionize in solution; the molecule is characterized by an oil-soluble portion and a water soluble group. These are based on the condensation of fatty alcohols, fatty acids, or on alkyl phenols with ethylene oxide, for example, the ethoxylated-alkyl phenols. The non-ionics are next in commercial importance to the anionics and, owing to their low foaming characteristics, they are finding increasing use in controlled suds detergents for automatic washers. Non-ionic surface-active agents can be converted to anionics by sulphation or sulphonation. Most of the non-ionics are in liquid form; they are used in textile processing since they minimize the difference in dye affinity of various fibres.

Cationics are agents in which the hydrophobic part of the molecule is positively charged and moves in solution toward the cathode. Cationic surface-active agents form a much smaller family in terms of commercial importance than the above two, and in general are weak in detergent power. They are used for textile softening and lubricating as well as for germicidal functions. Typical examples of cationic surface-active agents are quaternary ammonium salts and salts of fatty amines.

(1) B.T.N. Explanatory Notes, p. 330; George S. Brady, Materials Handbook, p. 250; Transcript, Vol. 44, p. 6554-5

Amphoteric or ampholytic surface-active agents contain both an acidic and a basic function in their structure. Among these are the amino-carboxylic acids. This last family had virtually no commercial importance in Canada in 1961.

Of the estimated commercial value of all types of surface-active agents used in Canada in 1964, of about \$40 million, anionics probably comprised about 80 per cent, non-ionics from 15 to 17 per cent, cationics 2 to 3 per cent and amphoterics virtually none.

In volume terms, the three surface-active agents said to have the largest use are sodium dodecyl benzene, sodium lauryl sulphate and ethoxylated nonyl phenol; these are based on dodecyl benzene, fatty alcohols and ethylene oxide.

Surface-active agents are used for many purposes, principally incorporated in detergents and cleaning preparations for household and industrial uses. The chief industrial uses are for textiles, pulp and paper, leather, metals, surface coatings, mining and oil and gas. Surface-active agents are also used in hand soaps and shampoos, special protective creams, cosmetics, in the cleaning of glass and containers, in the washing and treatment of fruits, in laundry, for cleaning paint surfaces and for cleaning linoleum. Miscellaneous uses include fire extinguishers, pesticides, drying of lumber, wetting of cement, cleaning draperies and carpets, water repellents and photography. In the textile industry, their principal use is for wetting, bleaching, dyeing, softening, washing, finishing and wool scouring. In the pulp and paper industry, they are used for degreasing and softening paper machine felts, de-inking of paper, increasing water absorption and paper sizing. In leather processing, they are used for wetting, softening, tanning, dyeing, degreasing and oiling. In metal treatment, they find use in cleaning of metal, quenching, cutting oils and aluminium processing. In surface coating, they are used as dispersing agents for pigments and colours and in paints. In the mining industry, they are used for ore flotation, and in the oil and gas industry, for breaking emulsions and in the acid treatment of petroleum.⁽¹⁾

In brief, the main functions of surface-active agents are: (a) affecting the water surface tension, or making water wetter, as the primary function, (b) emulsification — modification of the surface tension of two liquids which do not normally mix, to form a permanent heterogenous mixture, and (c) as a detergent — a soil removal function.

Although the use of surface-active agents started in Europe in 1831, when sulphated olive and almond oils were used in textile dyeing, the first true surfactant was developed in 1916 in Germany by Hoechst, when a benzyl naphthalene sulphonate was produced and used in dyeing wool. Further developments in Germany were in the sulphuric acid esters of fatty alcohols and the alkyl benzene sulphates, the development of which was hindered by the lack of petroleum raw materials, fatty acid esters and fatty amide sulphonates.

(1) Transcript, Vol. 44, p. 6574-5

The most widely used surface-active agents are the alkyl benzene sulphonates, originally produced in the United States in 1937, reaching commercial significance after World War II. Following the alkyl benzene sulphonates (alkyl aryl sulphonates), the next in importance are fatty alcohol sulphates among the anionic surfactants. The first household detergent sold in America was based on the sulphate of lauryl alcohol.

The developments in non-ionic surfactants stemmed from the patents issued to Scholler and Wittwer in the U.S.A. in 1930, covering the use of ethylene oxide as a solubilizing group. Steindorff and his associates invented the alkyl phenol derivatives in the early thirties which, when reacted with ethylene oxide, formed the largest single class of non-ionic surface-active agents.

The development of surface-active agents in Canada is said to have followed closely that in the United States. Most of the surfactants used or produced initially in Canada were the alkyl benzene sulphonate or alcohol sulphate types. However, with the beginning of large-scale commercial production of liquid dish-washing detergents in Canada in 1951, the production of non-ionic surface-active agents was considerably enlarged; most of the non-ionics, however, were still converted to anionics by sulphation or sulphonation.

The two main types of non-ionics have been the ethoxylated alkyl phenols and ethoxylated oxo-alcohols. The growing use of automatic washing machines and the need for low foaming detergents further enhanced the development of low sudsing detergents of non-ionic type. At the same time, the use of surfactants increased in textiles, wool scouring, metal rolling and paints.

The production of specialty detergent products, for example in the field of diaper cleaning, led to the increased consumption of the cationic surface-active agents because of their germicidal properties.⁽¹⁾

The latest trend in the production of surface-active agents is towards the development of biodegradable products. As most of the synthetic detergents produced in Canada and elsewhere are based on anionic alkyl benzene sulphonate, which is highly resistant to biodegradation, the problem of foam in streams, rivers and sewers has increased, thus increasing the interest in replacement of "hard" detergents with "soft" detergents which decompose with other wastes and are easily assimilated in sewage treatment. In order to soften detergents, the industry is in the process of replacing alkyl benzene sulphonates (ABS) with new surfactants based on linear alkylate sulphonates (LAS), and with alcohol sulphate (AS), a fatty alcohol derivative. The new materials are expected to degrade as rapidly as the organic components of ordinary sewage. The substitution of linear alkylate sulphonates or alcohol sulphate in new formulations is said to have no effect on the cleaning power of the detergent.

In Canada, the first step towards production of a low-cost biodegradable household detergent base is reported to have been taken by Hart Products Company of Canada Ltd., Guelph, Ontario.

(1) Transcript, Vol. 44, p. 6555-9

"The company will manufacture and distribute the Conoco (Continental Oil Co.) line of bio-degradable Alfonic ethoxylates, and a range of soft ether sulfates made from primary straight-chain alcohols. Hart Chemical will react imported alcohol with ethylene oxide to make the Alfonic adducts and sulfate the ethoxylate compound to produce ether sulfates. Hart Chemical will also supply unreacted Alfol alcohols."(1)

Among the other companies reported to be taking steps toward this end are chemical Developments of Canada Limited and Ogilvie Flour Mills. Chemical Developments of Canada Ltd., in an addition to its plant near Orillia, Ontario, was reported to be planning to produce a new line of biologically degradable surfactants based on straight chain alkylates and fatty alcohols.(2) At Ogilvie Flour Mills Co. Ltd., Montreal, Quebec, completely biodegradable surface-active agents are reported to have been prepared from wheat gluten. The gluten produces fatty amides which are soluble in water and are said not to remove the natural fats from skin or hair and to have a low level of irritation.(3) Imperial Oil Limited and Shell Canada Limited are reported to be planning to produce linear alkylates for the production of linear alkylate sulphonates.(4)

As the replacement of soaps by detergents had a detrimental effect on the markets for fats and oils, so the replacement of dodecyl benzene sulphonate by biodegradable products, especially the linear alkylate sulphonates, will have an adverse effect on the market for dodecyl benzene sulphonate which has been the most widely used surfactant.

Surface-active agents are sold by brand names, and it was stated at the public hearing that in 1961 there were over 2,800 trade names for surfactants in the U.S.A. based on ten or fifteen families. The prevalence of trade secrets and the selection of a particular surfactant by its properties are some of the factors which led to the production and marketing of so many brands and types of surface-active agents. Not only are there innumerable trade names for surfactants, but there also are several names for the same product. Further, they are also subject to constant change with new products appearing on the market at a rapid pace. A spokesman at the hearing quoted nine different designations for one well known product based on ethylene oxide.(5) The prevalence of so many trade names leads to confusion in the market, and it was stated at the public hearing that there is no technical justification for so many names for classification purposes.

Though surfactants are the principal elements in detergents, the detergents themselves have different characteristics. While they are basically organic chemicals, detergents are compounded products, manufactured for specific jobs of cleaning, etc. A detergent may be

(1) Canadian Chemical Processing, March 1965, p. 6

(2) Chemistry in Canada, September 1964, p. 16

(3) Chemical Week, September 19, 1964, p. 68

(4) Canadian Chemical Processing, July 1965, p. 76

(5) Transcript, Vol. 55, p. 8354, 8359

a surface-active agent, with a peptizing function of removing dirt; it may also have an agent that prevents redeposition of the dirt. Further, almost all the surfactants are sold in bulk while a major part of detergents is sold at retail in small packages.

Raw Materials and the Process of Manufacture

Surface-active agents are made from raw materials which are usually blends of organic chemicals that have not been separately defined. These blends are stated to be more economical to use than the separate, chemically defined compounds.

The principal raw materials used in the manufacture of surfactants in Canada are: alkyl benzene (principally, dodecyl benzene and also known as detergent alkyd), fatty alcohols, oleum, caustic soda, ethylene oxide, diethanolamine, monoisopropanolamine, monoethanolamine, methanol, nonene, phenol, sodium-tripolyphosphate, sulphuric acid, toluene, xylene and sulfamic acid. The most widely used of these materials are dodecyl benzene, fatty alcohols and ethylene oxide; of these, the largest is dodecyl benzene.

Fatty alcohols are of four types: lauryl alcohol, (dodecanol), myristic alcohol (tetradecanol), cetyl alcohol (hexadecanol) and stearyl alcohol (octadecanol). All of these are higher fatty alcohols, either natural or synthetic.

It was stated that the synthetic fatty alcohols are identical in use and properties to the natural products and can be used as direct replacement for natural fatty alcohols in detergent formulations. Further, because of the fluctuations in the prices of natural fatty alcohols, synthetic fatty alcohols, with relatively steady prices, are becoming more popular.⁽¹⁾

The three raw materials recently introduced for use in biodegradable detergents are linear alkylate sulphonate (LAS), straight-chain detergent range alcohols (fatty alcohol sulphates) (AS), and oleyl alcohols.⁽²⁾

It was stated at the public hearing that most of the raw materials required for the manufacture of surface-active agents are obtainable from Canadian sources. Dodecyl benzene is produced by Imperial Oil Limited at Sarnia, Ontario and by Shell Canada Limited at Montreal, Quebec. Alkylated phenols are produced by Hart Products Company of Canada Limited, Guelph, Ontario, Chemical Developments of Canada Limited and Dominion Rubber Co. Limited. Fatty alcohols are not produced in Canada and are imported. Also imported are materials such as coconut monoglyceride, sodium sulphate, sodium lauryl sulphate, alkyl glyceryl ether sulphonates and tall oil ethylene oxide condensate.

Although surface-active agents are sold on a one hundred per cent active basis, they are not produced as such. Several of the surfactants are produced at forty per cent active, the balance of the product being water that has gone into the process.⁽³⁾

(1) Transcript, Vol. 103, p. 15595

(2) Oil, Paint and Drug Reporter, August 2, 1965, p. 55

(3) Transcript, Vol. 44, p. 6635

Surfactants are mainly produced by sulphonation, the raw materials being sulphated to make them surfactant. Although this method is used in most cases, polymerization was said to be used for the production of surfactants based on ethylene oxide. The process of sulphonation is either a batch operation or a continuous operation in which the hydrocarbon is treated with sulphuric acid or oleum under controlled conditions.

The selection of a particular type of operation depends on the scale of production and the economies of the process. The continuous process is stated to be more economical and has less undesirable by-products than the batch process. It was stated in the joint submission of nine companies:

"In the manufacture of surface-active agents, a number of chemicals are reacted together to produce a given end product. In very few cases do these quantities balance, as most processes also produce undesirable by-products. It is extremely difficult, particularly in Canada, to find markets for these by-products and they are usually sold at very low prices. As an example, in the continuous alkylation of Nonyl Phenol, one may expect to obtain a yield of 95% to 98% of Mono Nonyl Phenol, the desired product, with the balance being polyalkylates. In the case of batch operations one could expect to obtain a yield of 88% to 94% of the desired product. The Mono Nonyl Phenol is sold at a price of 20¢ to 25¢ lb., while the polyalkylate, which is generally used as an insecticide emulsifier, can only command a price of 5¢ to 10¢ lb. Thus large scale producers continuous process benefit not only from the normal effect of scale, but also benefit by obtaining better yield of desired product."⁽¹⁾

It was further stated in the same submission that the Canadian producer of surface-active agents, because of a relatively smaller domestic market than the U.S.A., usually employs a batch method of production as against the continuous process employed by his U.S. competitor, and has to design his equipment for more flexible operation. It was observed that the large-scale plants with continuous process can be more automated and have lower processing costs than the batch operation.⁽²⁾

At the time of the public enquiry none of the manufacturing companies operated its plant on the continuous sulphonation basis; since then some of the companies have adopted the continuous process and installed new automatic facilities. It was reported in 1964 that

"Both Canada Packers and Chemical Developments of Canada have new sulphonation processes at their plants. The processes are continuous and fully automatic, from sulphur burning through to the final neutralization.

⁽¹⁾ Transcript, Vol. 44, p. 6565-6

⁽²⁾ Same, Vol. 44, p. 6565-6

"Canada Packers placed its unit in production in Toronto a couple of months ago. CDC has its unit for production this fall at its Longford Mills plant near Orillia. Its cost is \$650,000 and in addition to the usual type of dodecyl benzene sulphonates, the unit will produce a new line of biologically degradable surfactants based on straight chain alkylates and fatty alcohols."(1)

Procter & Gamble, Colgate-Palmolive and Witco Chemical are also reported to have adopted continuous process, particularly for dodecyl benzene sulphonation.(2)

Ethylene oxide based surfactants are prepared by the polymerization reaction of ethylene oxide with the appropriate alcohol, phenol, acid, amine, etc. The polymerization is carried out at relatively high temperature and is catalyzed by alkalies.(3)

The Industry

The surface-active industry in Canada manufactures and sells a full range of surfactants, and according to the companies' general submission, there were at least thirteen companies wholly or partially engaged in the processing of these products in 1961.(4)

1. Canadian Aniline & Extract Co., Limited, Hamilton, Ont.
2. Chemical Developments of Canada Limited, Montreal, Que.
3. Clough Chemical Co. Limited, St. Johns, Que.
4. Hart Products Co. of Canada Ltd., Guelph, Ont.
5. Colgate-Palmolive Limited, Toronto, Ont.
6. Lever Brothers Limited, Toronto, Ont.
7. The Procter & Gamble Company of Canada, Limited, Toronto, Ont.
8. Nopco Chemical (Canada) Ltd., London, Ont.
9. Scholler Brothers, Limited, St. Catharines, Ont.
10. Trilon Chemicals Limited, Lachine, Que.
11. Lignosol Chemicals Limited, Quebec, Que.
12. Surpass Petrochemicals, Ltd., Toronto, Ont.
13. Carbide Chemicals Company, Montreal, Que.

Note: The above list is incomplete; it was stated that there are, in addition, many small firms.

Of the thirteen companies listed above, eight were located in Ontario and five in Quebec. The nine companies that presented a joint submission in 1961, namely, Canadian Aniline & Extract Co., Chemical Developments of Canada Limited, Clough Chemical Co. Limited, Colgate-Palmolive Limited, Hart Products Co. of Canada Ltd., Lever Brothers Limited, Lignosol Chemicals Limited, Scholler Brothers Limited and Surpass Petrochemicals Ltd., accounted for 75 per cent of Canadian production of surface-active agents.(5) Most of these companies are subsidiaries of American companies.

(1) Chemistry in Canada, September 1964, p. 16

(2) Canadian Chemical Processing, June 1964

(3) Transcript, Vol. 55, p. 8354

(4) Same, Vol. 44, p. 6581

(5) Same, Vol. 44, p. 6545

Each of the larger firms produces a wide range of surface-active agents while the comparatively small firms concentrate on one or two families of surfactants.

The spokesmen for Procter and Gamble and Lever Brothers, two large manufacturers and users of surface-active agents, stated at the public hearing that the industry in Canada is well developed and is capable of meeting all essential needs; with the exception of a few specialty items, all types of surfactants are available from Canadian manufacturers.

The joint submission by the nine companies contained an estimate of the size of the industry in 1959, by type of product, as follows:

Production of Surface-active Agents in Canada,
by Type of Product, 1959

<u>Product Type</u>	Approximate Production <u>Per Year</u> lb.
<u>Cyclic</u>	
Ester and ethers non-sulphonated	8 - 10,000,000
Nitrogen containing non-sulphonated	2,000,000
Dodecyl benzene	30 - 35,000,000
All others	500,000
Lignin derivatives	8 - 10,000,000
Naphthalene derivatives	300,000
Petroleum aromatics water soluble	..
Toluene sulphonic acid, sodium salt	700,000
Xylene sulphonic acid, sodium salt	1,000,000
All others	1,500,000
<u>Acyclic</u>	
Esters and ethers non-sulphonated	8 - 10,000,000
Nitrogen containing non-sulphonated	5,000,000
Phosphorus, containing non-sulphonated	Nil
Salts, non-sulphonated	1,000,000
Acid, alcohols, and esters, sulphated and sulphonated	12,000,000
Nitrogen containing sulphated and sulphonated	500,000
Oils, fats and waxes, sulphated and sulphonated	2,500,000
<hr/>	
TOTAL	81 - 92,000,000
<hr/>	

Note: The listing of cyclic and acyclic products is that of the U.S. Tariff Commission.

Source: Transcript, Vol. 44, p. 6579

An estimate of the productive capacity for sodium alkyl benzene sulphonates (ABS) is given below.

Approximate Capacities of ABS Plants, 1964

<u>Company</u>	<u>Location</u>	<u>Capacity</u> ^(a) lb./yr.
Procter & Gamble	Hamilton	20,000,000
Lever Bros.	Toronto	20,000,000
Colgate-Palmolive	Toronto	25,000,000
Canada Packers	Toronto	15,000,000
Chemical Developments	Longford Mills	15,000,000
Myriad Detergents	Quebec City	5,000,000
Witco Chemicals	Oakville	5,000,000
	Brantford ^(b)	10,000,000
TOTAL		115,000,000

(a) These capacities are order of magnitude figures in lb./year of alkyl benzene sulphonates (as sodium salt)

(b) This plant was not definite

Source: Canadian Chemical Processing, June 1964

Although the capacity figures in the above table are not exactly comparable with the production data of the previous table, they do suggest that the surface-active agent industry in Canada has witnessed significant growth since 1959.

As most of the surfactants are produced by the companies which also produce soaps and detergents and are used captively in the manufacture of these products, data on the production of surface-active agents are not available separately. It was, however, estimated by the nine companies in their joint submission that the Canadian production of surface-active agents in 1959 was of the order of 80,000,000 pounds, including all major and most of the sub-category types of surfactants.⁽¹⁾

Based on the proportion of surface-active agents used in the manufacture of different types of synthetic detergents and for miscellaneous purposes, Canadian production of surfactants in the years 1958-64 is given below. The details of these estimates are given in Appendix I.

⁽¹⁾ Transcript, Vol. 44, p. 6563

Estimated Production of Surface-Active agents in Canada,
1958-64(a)

<u>Year</u>	<u>'000 lb.</u>	<u>\$'000</u>
1958	71,300	20,300
1959	77,700	22,200
1960	89,500	24,400
1961	95,400	25,200
1962	112,500	29,300
1963	107,600	27,200
1964	122,600	30,600

(a) Estimated on the basis of production of synthetic detergents, D.B.S., Manufacturers of Soap and Cleaning Compounds, Cat. No. 46-214

Although the production of surface-active agents has shown an estimated overall growth from 1958 to 1964 of 72 per cent in volume and 50 per cent in value, the increase in surfactants for industrial use was far more spectacular. While the increase in household detergent type surfactants was 43 per cent in quantity and 25 per cent in value during the seven year period covered in the above table, the increase in industrial type was 209 per cent in quantity and nearly 340 per cent in value. In 1958, the production of industrial-type surfactants was about one fifth of the household type; by 1964 it was about one half in terms of volume.

The more pronounced advance in the value than in the quantity of industrial detergents reflects the fact that whereas, in very approximate terms, the average cost of surfactants for household use declined slightly, from about 30¢ a pound in 1958 to about 27¢ a pound in 1964, the average cost of surfactants for industrial use increased from about 13¢ a pound to over 18¢ a pound during the same period.

Despite the fact that the surfactant industry has had a significant growth during the past few years, it was said to suffer from smaller scale of production, lack of vertical integration, high cost of transportation of raw materials and finished product compared with the industry in the U.S.A. All these factors were said to have contributed to the higher cost of production of surface-active agents in Canada, said to be 15 to 20 per cent, than in the United States. Transportation costs were mentioned both with respect to raw materials and finished products. Although a large number of raw materials are made in Canada, they were said to be transported greater distances to reach their consuming points than those in the United States. In this connection, it was stated that there were only four manufacturers of toluene in Canada, compared to ninety in the U.S.A., and the raw material is moved from Sarnia to Toronto in amounts of only one or two tank cars a month.⁽¹⁾

⁽¹⁾ Transcript, Vol. 44, p. 6567, 6650

It is difficult to ascertain the difference in costs of production. The adoption of the continuous process by some of the companies in Canada, with more automatic and modern plants, however, should favourably affect the cost of production.

It was also stated in the joint submission of the nine companies that many of the large producers of surface-active agents in the United States entered this field in order to find an outlet for the basic raw materials which they were producing. In comparison with the producers in the United States, no manufacturer of these products in Canada produces any of the basic raw materials. Thus the cost of raw material to the Canadian manufacturer was thought to be higher than to the U.S. manufacturer.⁽¹⁾

The Canadian manufacturer has to import a few raw materials not available from Canadian sources and, in certain cases, has to pay duty on them. For example, sulphamic acid and mono isopropanolamine are imported from the United States and subject to a rate of duty of 15 p.c.

A table showing differences in raw materials cost, selected from those submitted by the producers of surface-active agents, is reproduced on a following page, together with a comparison of the prices of the agents. A fuller presentation of prices and raw material costs is given in Appendix I.

It might be pointed out that most of the calculations of costs and prices refer to 1959 or 1960, before the devaluation of the Canadian dollar. Moreover, the quoted selling prices are generally higher in Canada than in the U.S.A. by a greater amount than the differences in raw material costs, suggesting that the existing price structure allows some margin for other cost disadvantages. In some instances the price differential is greater than 20 per cent.

Precise information on the value of materials used by the surface-active agents industry is not available from published sources. However, in respect of the more important raw materials, the following estimates were made in the statement on behalf of Colgate-Palmolive Ltd. and Lever Brothers Ltd. for 1960.⁽²⁾

Selected Raw Materials Used, 1960

Detergent alkylates	\$1,900,000
Fatty alcohols	1,542,000
Nonyl phenol	600,000
Ethylene oxide	<u>500,000</u>
Total	\$4,542,000

In regard to dodecyl benzene sulphonate, it was further stated that its use in Canada amounts to 7 to 8 million pounds a year;⁽³⁾ imports of fatty alcohols in 1962 amounted to 9.6 million pounds. As mentioned earlier, fatty alcohols are not produced in Canada and the entire stock is imported.

⁽¹⁾ Transcript, Vol. 44, p. 6566-7

⁽²⁾ Same, Vol. 40, p. 5944-5

⁽³⁾ Same, Vol. 44, p. 6647

	No. lb. Used	Canada		U.S.A.	
		Price \$/cwt.	Amount Approximate(d) Selling Price \$/cwt.	Price \$/cwt.	Amount Approximate(d) Selling Price \$/cwt.
Ethoxylated nonyl phenol, 4 mols. E.O.					
Nonyl phenol	55.7	11.82	6.58	10.90	6.07
Ethylene oxide	46.5	17.00	<u>7.91</u> 14.49	15.50	<u>7.21</u> 13.28
			22.50		19.50
Above sulphated to anionic					
Ethoxylated nonyl phenol	80.5	14.49	11.66	13.28	10.69
Sulfamic acid(a)	19.7	17.95	<u>3.54</u> 15.20	14.75	<u>2.91</u> 13.60
			17.00		13.75
Sodium toluene sulphonate(e)					
Toluene	54.3	4.08	2.22	3.47	1.88
Sulphuric acid	67.8	1.20	.81	.93	.63
Caustic soda 50%(b)	69.6	2.50	<u>1.74</u> 4.77	2.05	<u>1.43</u> 3.94
			10.00		8.00
Sodium xylene sulphonate(f)					
Xylene	58.5	4.50	2.63	3.82	2.23
Sulphuric acid	63.2	1.20	.76	.93	.59
Caustic soda(b)	65.0	2.50	<u>1.62</u> 5.01	2.05	<u>1.33</u> 4.15
			10.50		8.00
Coconut monoethanolamine					
CNO methyl ester	86.7	15.42	13.40	15.58	13.51
Monoethanolamine	26.5	27.00	<u>7.15</u> 20.55	25.00	<u>6.62</u> 20.13
			27.00		27.00
Dodecyl benzene sulphonate(f)					
Dodecyl benzene(c)	72.5	11.50	8.34	11.50	8.34
Oleum	87.5	1.38	1.20	1.25	1.09
Caustic soda 50%(b)	36.0	2.50	<u>.90</u> 10.44	2.05	<u>.74</u> 10.17
			16.00(g)	.45	<u>2.22</u> 7.95
Credit spent acid	55.5	.40	<u>2.22</u> 8.22		14.00(g)

(a) U.S. price plus duty 15% (208t) plus freight from border 1.00/cwt. (e) Made and shipped 30% active, sold 100% active
 (b) Canadian price includes 30¢ freight; U.S. includes 15¢ freight (f) Made and shipped 40% active, sold 100% active
 (c) All prices f.o.b. shipping point, no freight included (g) Price delivered
 (d) Prices for 40,000 lb. T/T f.o.b. plant Source: Transcript, Vol. 44, p. 6585

Almost all the raw materials were said to compete in their use in surfactants, and the competition is more keen between detergent alkylates and fatty alcohols, although the former are used principally in powdered detergents and fatty alcohols in liquid detergents.

Imports of dodecyl benzene and fatty alcohols, the two major raw materials used in surfactants, are shown in the following tables.

Imports of Alkylaryl Hydrocarbons, Unsulphonated,
(Dodecyl benzene) From U.S.A., 1956-63

<u>Year</u>	<u>\$'000</u>
1956	1,940
1957	2,120
1958	1,220
1959	410
1960	50
1961	..
1962	105
1963	350

Source: Dept. of Industry, Chemical Import Trends

With the increasing domestic production of dodecyl benzene, imports of this material have shown a substantial decline since 1957.

Imports of Fatty Alcohols into Canada, 1959-64

<u>Year</u>	<u>Total</u>		<u>U.S.A.</u>	<u>U.K.</u>	<u>W. Germany</u>
	<u>'000 lb.</u>	<u>\$'000</u>	<u>\$'000</u>	<u>\$'000</u>	<u>\$'000</u>
1959	..	1,949	1,728	3	217
1960	..	1,542	1,402	2	136
1961	..	1,914	1,717	3	188
1962	9,610	1,756	1,512	2	237
1963	9,765	1,799	1,538	8	254
1964	14,397	2,640	2,099	262	269

Source: D.B.S., Trade of Canada, Imports

In contrast to dodecyl benzene, the value of imports of fatty alcohols remained at about the same level from 1959 to 1963, and showed some increase in 1964.

Further details are presented for detergent alkylates (dodecyl benzene) under B.T.N. heading 38.19; for fatty alcohols under B.T.N. 15.10; for nonyl phenol under B.T.N. 29.06 and for ethylene oxide under B.T.N. 29.09.

At the time of the public hearing in 1962, biodegradable, or soft detergent preparations had not reached significant commercial importance in Canada, but the possibility of the replacement by them through the years, of a large part of materials currently in use was the subject of some discussion. In this regard, the spokesman for Procter and Gamble and Canada Packers stated that fatty alcohols were the only commercially available raw material used to manufacture completely biodegradable surfactants and that the "soft" alkyl benzene surfactant was not nearly so biodegradable as the fatty alcohol types. Neither the soft alkyl benzenes nor alpha olefins were made in Canada, and there were few plants then established in the world to make fatty alcohol or alpha olefin types of surfactants. For biodegradable detergents, therefore, the soft alkyl benzenes or the fatty alcohols would have to be imported until facilities for their production or for new, satisfactory, completely biodegradable raw materials are available in Canada.⁽¹⁾

The Canadian Market

As mentioned earlier, there are several uses of surface-active agents; they are, however, principally used in the manufacture of detergents, and to a lesser extent sold in bulk for direct industrial use. The detergent industry is by far the largest consumer of surfactants, followed by the textile and paper industries; the others are relatively minor users. They include leather processing, metal treatment, surface coating, the mining industry, oil and gas treatment and wax, polishes and paint manufacture. Because of the large number of surfactants sold and because of the overlapping uses, it is difficult to obtain statistics by type and use. In view of these considerations the market data for surfactants are divided into two broad categories: those used in household detergents and those meant for industrial use. The difficulties of obtaining accurate statistics were also expressed in the companies' general submission:

"Due to the complexity of this field and to overlapping uses, no accurate statistics are available as to the percentages of surface-active agents used in detergents versus industrial uses. If we use the broad definition of surface-active agents and include the uses mentioned above, it is estimated that 50% of the surface-active agents are used in synthetic detergents as sold in the retail market, and about 50% used in industrial application."⁽²⁾

At another stage in their submission, the companies stated:

"We estimate that the household soap and detergent industry in Canada consumes 50,000,000 pounds of surface-active agents in a year, valued at \$15,000,000 to \$16,000,000 and the industrial field consumes 55,000,000 pounds valued at \$13,500,000."⁽³⁾

(1) Transcript, Vol. 103, p. 15524-6

(2) Same, Vol. 44, p. 6553

(3) Same, Vol. 44, p. 6563

As pointed out earlier, the major portion of the surface-active agents is produced for captive use and not sold in the market. The companies presenting the general submission estimated the consumption of surfactants in 1959 on the basis of their proportion of different types of detergents produced in the country. The details of this estimate and of similar estimates for other years are given in Appendix I. Summary tables are produced below. Exports were said to be negligible.

The companies' estimate of the use of surfactants for 1959 is as follows:⁽¹⁾

<u>Total Canadian Consumption</u>	<u>lb.</u>	<u>\$</u>
Canadian Production for:		
Soaps and Detergents (household)	50,000,000	15,000,000
Industrial Products	35,690,000	6,616,000
Imports (allocated to Industrial)	<u>20,000,000</u>	<u>7,000,000</u>
Total	105,690,000	28,616,000

Applying the same procedure to other years gives the following estimates of consumption of surface-active agents.

Estimated Consumption of Surface-Active Agents in Canada,
Selected Years, 1958-64^(a)

<u>Type of Market</u>	<u>1958</u>	<u>1960</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
	thousands of dollars				
Surfactants used in soaps and detergents (Household)	14,400	15,700	17,400	16,900	18,000
Surfactants used in industrial detergents and in miscellaneous industries	5,900	8,700	11,900	10,300	12,600
Imports ^(b)	<u>7,662</u>	<u>8,708</u>	<u>10,509</u>	<u>..</u>	<u>8,629</u>
Total	27,962	33,108	39,809	..	39,229

(a) Estimated from synthetic detergent shipments, D.B.S., Manufactures of Soap and Cleaning Compounds, Cat. No. 46-214, using ratios given in Appendix I

(b) Include surface-active agents and cleaning compounds which were stated to be mostly surface-active agents

Source: Based on Transcript, Vol. 44, p. 6576-8; Dept. of Industry, Chemical Import Trends; D.B.S., Trade of Canada, Imports

⁽¹⁾ Transcript, Vol. 44, p. 6578

The consumption of surfactants in Canada grew by 40 per cent from \$28 million in 1958 to over \$39 million in 1964; of this growth, domestic production accounted for a somewhat greater share than imports which, moreover, in this tabulation, also contain cleaning compounds. In 1958, 73 per cent of the total demand was satisfied by domestic production and 27 per cent by imports. In 1964, the proportion of demand met by domestic production increased to 78 per cent and imports dropped to about 22 per cent.

In regard to the surfactants used in retail detergents, it was stated by the spokesman for Lever Brothers that "surfactants used in liquid dishwashing detergents account for about one quarter of the total used in all retail detergents sold in Canada", and that, "powdered detergents represent about three quarters of the market in Canada."(1)

Data showing the market by regions are not available but regional differences in the production and sale of surfactants used in household detergents are mostly based on the concentration of population; Ontario, having the largest population, is the biggest market for household surfactants. In the industrial field, Ontario is still very important; Quebec takes a large portion because of the textile industry, followed by British Columbia, for use in pulp and paper, and Alberta in oil and gas production. The Atlantic Provinces, Quebec and Northern Ontario also consume considerable amounts of industrial surfactants because of their pulp and paper industries.

As stated earlier, surface-active agents are sold by brand names, and there are several names for one product; the more than 2,800 brand names for surfactants in the United States, comprising ten to fifteen families, compete with each other. Within each family, the products are largely inter-changeable and between the families, surface-active agents in many cases are competitive. It was stated by the surfactant producers that competition in the industry is "keen and real", and "there is no scientific justification for the marketing of the vast number of surfactants of the same type and having different names."(2)

The Canadian surface-active industry is also said to face competition from foreign producers who were said to supply approximately 55 per cent of the industrial market and 25 per cent of the total market.(3) It is, however, difficult to assess the extent of foreign competition, in the absence of detailed data on products and prices.

Foreign Trade

Imports of surface-active agents and related products are reported in various statistical classifications that have witnessed considerable revision in the past few years. The details of imports appear in Appendix I; a summary table follows.

(1) Transcript, Vol. 103, p. 15495

(2) Same, Vol. 44, p. 6568

(3) Same, Vol. 44, p. 6570

Imports of Surface-Active Agents,
Selected Years, 1956-64

<u>Product</u>	<u>1956</u>	<u>1958</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1964</u>
	thousands of dollars					
Surface-active agents(a)	4,799	3,950	3,670	4,500	5,795	5,741(b)
Cleaning compounds	1,050	1,055	1,800	4,860(c)	975	..
Cleaning compounds, sodium base	1,959	2,657	3,238	..	..	..
Washing and cleaning preparations(d)	..	..	..	..	3,739	2,888
Total	7,808	7,662	8,708	9,360	10,509	8,629

(a) Includes alkanolamides, amides, amines and other fatty acid derivatives; alkylaryl hydrocarbons unsulphonated; alkyl aryl sulphonates; alkyl sulphates; ethyleneoxide condensates; quaternary ammonium salts and others

(b) "Surface-active agents compounded", includes, in addition to (a), sodium base ammonium compounds

(c) In 1961, includes sodium base cleaning compounds

(d) New classification in 1962

Source: Department of Industry, Chemical Import Trends

With the growing market for surface-active agents, the value of imports showed periods of increase during the past nine years, but the available data suggest that, in 1964, imports were somewhat lower in value than they had been in some of the earlier years.

A major part of the imports were said to be for use in the industrial field rather than for use in the household detergent field. Some of the imports comprised surface-active agents not produced in Canada, some of which are of a highly specialized nature. These include products such as sodium lauryl sarcosinate, used in the manufacture of tooth paste, fluorochemical surfactants used in floor waxes, and also higher fatty alcohols. Most of the products are imported into Ontario and Quebec, but a significant portion also enters into British Columbia from the United States because of lower freight costs.(1)

Somewhat similar data to the above are available from U.S. exports figures, for a somewhat different classification of products.

(1) Transcript, Vol. 102, p. 15488

U.S. Exports of Detergents, Surface-Active Agents
and Other Cleaning Compounds, to Canada, 1960-64^(a)

<u>Product</u>	<u>1960</u>	<u>1961</u>	<u>1962</u> U.S. \$'000	<u>1963</u>	<u>1964</u>
Detergent alkylates, organic surface- active agents	47	32	56	49	33
Detergent intermediates, n.e.s. organic surface- active agents	1,022	1,220	1,025	649	477
Detergents, all types, organic surface- active agents	2,903	3,308	2,251	2,635	2,206
Organic surface- active agents, n.e.s.	2,010	1,819	1,973	2,360	2,602
Speciality cleaning and washing compounds, n.e.s.	<u>4,183</u>	<u>3,515</u>	<u>3,568</u>	<u>3,253</u>	<u>3,582</u>
Total	10,165	9,894	8,873	8,946	8,900

(a) It is difficult to isolate detergents from surface-active agents in these data. According to the companies' joint submission about 80 per cent would consist of surface-active agents.

Source: U.S. Dept. of Commerce, Exports

Most imports of surface-active agents are from the U.S.A. as the following table illustrates.

Imports of Compounded Surface-Active Agents,
by Country of Origin, 1964

<u>Country of Origin</u>	<u>'000 lb.</u>	<u>\$'000</u>	<u>\$/lb.</u>
United Kingdom	2,676	416	.16
United States	20,789	5,231	.25
West Germany	424	86	.20
Switzerland	9	6	.66
France	<u>2</u>	<u>2</u>	<u>.70</u>
All Countries	23,901	5,741	.24

Source: D.B.S., Trade of Canada, Imports, s.c. 429-79

In addition to the imports mentioned above, washing and cleaning preparations, valued at \$2.9 million, were imported in 1964; almost all of these were from the United States, with an average value of 27¢ a pound.

It is evident from the above table that the imports from Switzerland and France were of highly specialized nature, having an average value more than double that of imports in total. Dodecyl benzene sulphonate was mentioned at the public hearing as being imported from the United Kingdom; its price was said to be 12 to 12½¢ a pound.(1)

Of the imports from the United States, speciality cleaning and washing compounds comprised the largest category in 1964, as well as in the immediately preceding year, followed by organic surface-active agents. Details of U.S. exports to Canada are given in Appendix I.

The market and use of surface-active agents are rapidly changing as new products come into the market, most of which are developed outside Canada; consequently, imports are likely to continue in some degree irrespective of other competitive factors.

Exports of surface-active agents, if any, have been small; the Canadian products were said to suffer from relatively higher costs of production. However, the U.S. Bureau of Census recorded, for 1964, imports from Canada of six million pounds of surface-active agents and washing preparations, valued at nearly \$585,000. No imports to the U.S.A. from Canada were separately recorded prior to 1964.

Prices and Pricing Policies

A surface-active agent usually consists at least of active material and water; prices are generally governed by the active content of the surfactants. The spokesman for the Procter and Gamble Company stated at the public hearing that since the market for surface-active agents is highly competitive, little information is published on prices. He mentioned, however, that "surface-active agents are ranging anywhere from twelve cents a pound to 65+ cents a pound."(2)

Prices were also quoted at the public hearing for some popular surfactants. The Canadian price for dodecyl benzene sulphonate was quoted as 16¢ a pound, delivered, as against 12 to 12½¢ a pound from the U.K., delivered duty-paid, in drums in Montreal.(3) Sodium lauryl sarcosinate costs well over \$1 a pound; fluorochemical surface-active agents cost \$39 to \$59 per pound.(4)

The nine companies in their general submission, while comparing the Canadian cost of production of a few selected surfactants with the U.S. costs of similar products, also estimated approximate

(1) Transcript, Vol. 44, p. 6641

(2) Same, Vol. 102, p. 15396

(3) Same, Vol. 44, p. 6641-2

(4) Same, Vol. 102, p. 15397, 15471

selling prices in Canada and in the U.S.A. for these surfactants in 1959-60. These prices are quoted on the basis of 40,000 lb., tank trucks, f.o.b., plant.⁽¹⁾

<u>Product</u>	Approximate Selling Price, Canada	Approximate Selling Price, U.S.A.
	<u>\$ per 100 lb.</u>	
Ethoxylated Nonyl Phenol		
4 mols. E.O.	22.50	19.50
Above Sulphated to Anionic	17.00	13.75
Sodium Toluene Sulphonate	10.00	8.00
Sodium Xylene Sulphonate	10.50	8.00
Coconut Monoethanolamide	27.00	27.00
Dodecyl Benzene Sulphonate	16.00	14.00

Although published prices for surfactants in Canada are not available, the published prices of some of the products in the United States, in 1963, are given below with their brand names and type.

<u>Product</u>	<u>Price per lb.</u> \$U.S.
<u>Anionic</u>	
"Lathanol LAL" - Sodium lauryl sulfoacetate, powder, dentifrices, shampoos, anionic, 250-lb. fiber drums delivered (NA)	0.80
"Nacconol DBX" - alkyl benzene sodium sulfate, 40%, extra dense bead, cleaners, anionic, 50-lb. bags, C.L., T.L., delivered (NA)	0.13
"Nekal BA-75" - sodium alkyl naphthalene sulfonate, 65%, powder, anionic, surfactant for rubber, leather, disperser in paint and agricultural industries, drums, C.L., T.L. (GA)	0.38
"Orvus AB-15" - granules, alkyl aryl sulfonate, 40%, anionic, light, white, spray dried bead, base for powdered detergent; wetting agent, 50-lb. paper bag, C.L., T.L. (PG)	0.11½
"Orvus WA" - paste, sodium lauryl sulfate, neutral anionic, base for high foaming liquid detergents, shampoos, bubble bath, 470-lb. drums, C.L., T.L. (PG)	0.16½
"Solvadine S" - alkyl aryl sulfonate, anionic, industrial surfactant (CI)	0.40

(1) Transcript, Vol. 44, p. 6585

<u>Product</u>	<u>Price per lb.</u> <u>\$U.S.</u>
<u>Non-ionic</u>	
"Lipal 4LA, 7LA" - ethoxylated lauryl alcohol, emulsifier, disper., liq., 100%, non-ionic (DR)	0.41
"Lubrol WX" - fatty alcohol ethylene oxide condensate, liq., non-ionic, emulsifying agent (IC)	0.65
<u>Cationic</u>	
"Monazoline C,S" - high molecular weight imidazolines, cationic surface-active agents, fungicides, rust preventives, dispersants, anti-static, T.W., f.o.b. (MN)	0.45
"Siposan 7LUF" - quaternary ammonium salt, cationic, 55%, liq. T.T. (AA)	0.60
<u>Non-Specified</u>	
DDBSA dodecylbenzene sulfonic acid, 94% liq., active content, tanks (MO)	0.15
"Ethofats" - ethoxylated fatty acids, emulsifiers, rewetting agent for paper detergent, for textile scouring, wetting agents, C.L., T.L., delivered (AM)	0.29 $\frac{1}{4}$ -0.38 $\frac{1}{4}$
"Ninate 411" - alkyl aryl sulfonate, amine salt, emulsifier for solvent degreasers, oils, etc. (ST)	0.30 $\frac{1}{2}$
"Monamine AC-100" - fatty acid diethanolamide, 100%, liq., cleaning compounds, emulsifier, T.W., f.o.b. (MN)	0.26

Source: Chemical & Engineering News, October 28, 1963

Transportation

The producers of surface-active agents are located in Ontario and Quebec, more specifically around Toronto and Montreal. The raw materials are not generally made by the companies producing surfactants but are transported from other centres in Canada or abroad. Although most Canadian materials are produced in Ontario and Quebec not far from the producers of surface-active agents, some materials, such as fatty alcohols, must be imported. The producers stressed that in the U.S.A. companies manufacturing surface-active agents often either make basic raw materials or obtain them from nearby sources. Raw material costs for surface-active agents, partly reflecting transportation costs, were said to be higher in Canada by 10 to 20 per cent than in the United States. The surface-active agents themselves are chiefly

used captively by the producers, though some are shipped from producing points to consumers. Costs of transportation are of more concern for finished products, the detergent preparations, than for the surface-active agents. A factor that contributes to the cost of transporting the final product is that relatively small quantities are packaged at centrally located plants for retail trade across the country. This matter is dealt with in the later section on the finished products.

Tariff Considerations

The general submission by nine producers of surface-active preparations was presented in May 1961, at the hearing on some of the relevant organic chemicals of B.T.N. Chapter 29. In addition, submissions were made at the hearing of November 1962, on surface-active agents and at the hearing of March 1963, on the finished preparations. In total, twenty-two submissions were made dealing directly with surface-active agents of B.T.N. heading 34.02. Six submissions were on surface-active agents as such, nine on materials used in surface-active agents, five on classification and scope, and two expressing interest as consumers.

Classification, Scope and Definition

Surface-active agents are entered under the following tariff items of the Canadian Customs Tariff:

<u>Item</u>	<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
203a Chemical compounds composed of two or more acids or salts soluble in water, adapted for dyeing or tanning.....	Free	Free
208t All chemicals and drugs, n.o.p., of a kind not produced in Canada.....	Free	15 p.c.
216 Acids, n.o.p., of a kind not pro- duced in Canada.....	Free	15 p.c.
220a Chemical preparations, compounded of more than one substance, n.o.p.:— (i) When dry, or liquid contain- ing not more than two and one- half per cent of proof spirit	15 p.c.	20 p.c.
269b Alkyl aryl hydrocarbons, unsulphon- ated, for use in the manufacture of synthetic detergents..per gallon	Free	Free

<u>Item</u>		<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
*277	Oils, hydrogenated, blown, de- hydrated or sulphonated, not including blown or hydrogen- ated fish, seal or whale oils.....	15 p.c.	20 p.c.
711	All goods not enumerated in this schedule as subject to any other rate of duty, and not otherwise declared free of duty, and not being goods the importation whereof is by law prohibited.....	15 p.c.	20 p.c.
Ex.	Higher fatty alcohols, unsulphated, when imported by manufacturers of synthetic detergents for use exclusively in the manufacture of synthetic detergents in their own factories.....per gallon		1/3 ct.
791	Materials of all kinds for use in producing or manufacturing preparations provided for in tariff items 209b and 219a under such regulations as the Minister may prescribe.....	Free	Free
851	Materials for use in the manufacture of synthetic rubber..... (Expires 31st January, 1967)	Free	Free
865	Higher fatty alcohols, unsulphated, for use in the manufacture of synthetic detergents..... (Expires 31st October, 1966)	Free	Free
921	Materials of a kind not produced in Canada for use only in the manu- facture of goods enumerated in tariff items 901, 902, 903, 904, 905, 906, 907, 909, 910, 911, 912, 913, 914, 916, 917, 918(a), 918(b), 919 and 925, but not including goods themselves enumerated in tariff items 901 to 920, inclusive	Free	Free

* Not in Reference 120

It might be noted that none of these tariff items refers to the surface-active agent as such. Some of the items, however, do mention the materials which form the basis of surfactant manufacture, such as the alkyl aryl hydrocarbons of tariff item 269b and higher fatty alcohols of the Extract of item 711. The items under which most of the products are believed to enter Canada are temporary item 865 and tariff items 220a(i), 851 and 921.

A spokesman for the Industry Committee, while discussing the problem of classification with respect particularly to single defined chemicals, stated "all substances having surface-active properties are not surface-active agents for the sake of classification under heading 34.02."⁽¹⁾ In other words, it is difficult to classify a product simply on the basis of ability to perform a function. This is particularly true for single chemicals which, for the most part, are not classified in the B.T.N. by function but by chemical composition. However, under B.T.N. heading 34.02, preparations of certain generic types are classified because their principal function is as a surface-active agent. B.T.N. heading 34.02, as explained in the Explanatory Notes, covers anionic, non-ionic and cationic types of surface-active agents but does not provide for amphoteric or ampholytic surfactants mentioned in the nine companies' joint general brief and in the literature on this subject, though understood to be of very little commercial importance in Canada.

In regard to classification of goods, the main concern expressed was about the single defined chemicals which have surfactant properties and compete with the surface-active preparations of B.T.N. heading 34.02. The companies requested that either these chemicals be included in Brussels heading 34.02 for duty purposes or, if classified by the relevant headings, bear the same rates of duty as applicable to heading 34.02. These chemicals, classified particularly as organic chemicals of B.T.N. Chapter 29, or as mixtures of heading 38.19, were said to be very numerous and difficult to identify because they are sold by trade names.

Parties making submissions on this problem included the nine companies presenting the general submission which were: Canadian Aniline & Extract Co. Limited, Chemical Developments of Canada Ltd., Clough Chemical Co. Ltd., Colgate-Palmolive Ltd., The Hart Products Co. of Canada Ltd., Lever Brothers Limited, Lignosol Chemicals Limited, Scholler Brothers Limited and Surpass Petrochemicals Ltd.; also, other soap and detergent manufacturing companies such as The Procter and Gamble Company of Canada Limited and Chemical Developments of Canada Ltd.; and companies other than soap and detergent manufacturers, such as Atlas Powder Co., Hercules Powder Company (Canada) Ltd., Minnesota Mining and Manufacturing Company, as well as The Primary Textiles Institute.

Procter and Gamble and Chemical Developments, producers of ethylene oxide based surfactants, requested that single chemicals having surfactant properties either be included in B.T.N. heading 34.02 or be made subject to the same duty under chapter 29.

(1) Transcript, Vol. 102, p. 15356

Atlas Powder Company, making a submission on stearic acid, fatty acids and an oleic acid commercially known as sorbitan mono-stearate, requested that these products be classified as surface-active agents by heading 34.02, or possibly as miscellaneous preparations under heading 38.19. The products, oil soluble, are used as emulsifiers. The company further requested that fatty acid esters of sorbitol be dutiable at 15 p.c., B.P. and 20 p.c., M.F.N., and that the rates apply to them and other commercial surface-active agents, regardless of where they are classified.⁽¹⁾

Hercules Powder Company (Canada) Ltd. manufactures pine chemicals and rosin salts used in emulsifiers for synthetic rubbers. These emulsifiers, produced by polymerization, were referred to as a type of soap. The spokesman for the Hercules Powder Company, however, noted that the products are not used for detergent purposes, and likely should be classified more generally as rosin products of B.T.N. heading 38.08 rather than under heading 34.02.⁽²⁾ Further details on these products may, therefore, be found in the part of the report on heading 38.08.

Minnesota Mining and Manufacturing Company made a submission on a group of organic surfactants referred to as fluorochemical surface-active agents and used in the manufacture of liquid floor waxes and liquid polishes. Some of these might be single chemicals of B.T.N. heading 29.14 or 29.22. The company made a submission on six fluorochemicals under heading 29.14. These surfactants were said to be not produced in Canada and the company requested their duty-free entry, until made in Canada, whether classified as surfactants of heading 34.02 or as single-chemicals of Chapter 29. The company noted that the products had unique uses, particularly in liquid floor waxes and liquid polishes, where they were used in spite of the very high price. "Most organic surface-active agents range from \$.30 to \$.50 per pound whereas fluorochemical surface-active agents cost from \$39.00 to \$59.00 per pound."⁽³⁾ When the products are made in Canada, the company proposed that they be dutiable at 15 p.c., B.P., 20 p.c., M.F.N.

The Primary Textile Institute of Canada also raised the question of whether certain inorganic products mixed together to form washing preparations are classified by B.T.N. heading 34.02. The Institute provided a list of surface-active preparations and compounds, as given in Appendix III. The Institute did not make any specific recommendation on the rates of duty that these products should bear.

The following submissions were made concerning definitions. Canada Packers Limited, in connection with tariff items 865 and 711 Ex., suggested that the definition of fatty alcohols be modified to make specific the inclusion of synthetic fatty alcohols. As a guide the company suggested:

(1) Transcript, Vol. 62, p. 9253-5

(2) Same, Vol. 90, p. 13716

(3) Same, Vol. 102, p. 15471

"Fatty alcohol blends, natural and or synthetic, containing some or all of the following alcohols as active ingredients:

Lauryl alcohol (dodecanol)
 Myristic alcohol (tetradecanol)
 Cetyl alcohol (hexadecanol)
 Stearyl alcohol (octadecanol)"(1)

Based on the above definition the company further recommended:

"Provided fatty alcohol blends as defined above are permitted duty free entry under Brussels Heading 15.10 until 'made in Canada', we have no objection to the deletion of the following end-use items:

865 - Higher fatty alcohols, unsulphated, for use in the manufacture of synthetic detergents.

711 Ex. - Higher fatty alcohols, unsulphated, when imported by manufacturers of synthetic detergents for use exclusively in the manufacture of synthetic detergents in their own factories."(2)

The Procter and Gamble Company, agreeing with the definition of fatty alcohols as suggested by Canada Packers, also recommended that, provided fatty alcohol blends as defined above be established as an exception to B.T.N. heading 15.10 at Free, B.P. and Free, M.F.N. until made-in-Canada, the company had no objection to the deletion of tariff items 865 and the Extract from 711. These fatty alcohols are dealt with in this report under heading 15.10.

Other materials, having some relevance to heading 34.02 that are produced by Atlas Powder Company, include stearic acid, oleic acid, other fatty acids and fatty acid esters of sorbital. Atlas Powder Company requested rates of 15 p.c., B.P. and 20 p.c., M.F.N. on these products. These products, however, are usually traded as blends of chemicals, classified by heading 38.19; they are considered under that heading and noted under heading 15.10 as fatty alcohols.

Materials mentioned by the Hart Products Co. of Canada include ethers, ether alcohols, ether phenols, ether alcohol phenols, and the sulphonated derivatives of these products some of which are further processed. As separate, chemically defined products they are dealt with under B.T.N. headings 29.08 and 29.17. The products, particularly the sulphonated derivatives, if in a form to be classified by heading 34.02, would be encompassed in general submissions in this part of the report.

Proposals Regarding Rates of Duty

Although raw materials, particularly the single defined chemicals, are dealt with in chapters relevant to them, two basic materials used in the manufacture of surface-active agents which came up for discussion several times in the public hearing are briefly

(1) Transcript, Vol. 103, p. 15555

(2) Same, Vol. 103, p. 15555

dealt with in this part of the report. These two materials, dodecyl benzene and fatty alcohols, are generally blends of chemicals, primarily used for surface-active agents; they are highly competitive with each other and equal tariff treatment was requested for them. They were the subject of discussion also, respectively, under headings 29.01 and 15.10.

The tariff items currently applicable to the import of these two products are principally items 208t, 269b and 865. Items 269b and 865 provide duty-free entry respectively for alkyl aryl hydrocarbons and higher fatty alcohols, when for use in the manufacture of synthetic detergents.

Proposals relating to these materials were made at various times by different companies.

A request for duty-free entry of fatty alcohols was made by Imperial Oil Limited in its submission on April 7, 1961. The company proposed rates of $7\frac{1}{2}$ p.c., B.P. and 10 p.c., M.F.N. on imports of detergent alkylates (alkyl aryl hydrocarbons, unsulphonated) which it manufactures in Canada.⁽¹⁾ The company also recommended the elimination of end-use item 269(b), stating:

"If Imperial's recommendations of April 7, 1961 are accepted, the present end-use tariff item 269(b) should be eliminated in so far as the products commercially known as detergent alkylates are concerned."⁽²⁾

Procter and Gamble, one of the largest consumers of detergent alkylates and fatty alcohols in Canada, raised no objection to Imperial Oil's request for duty-free import of fatty alcohols or to its request for duty protection on detergent alkylates.⁽³⁾

Hart Products of Canada Limited, which manufactures certain phenols in Canada, asked for rates of 15 p.c., B.P. and 20 p.c., M.F.N. for these under B.T.N. heading 29.06.⁽⁴⁾

Colgate-Palmolive Limited and Lever Brothers requested that fatty alcohols and detergent alkylates -- dodecyl benzene, pentadecyl benzene and tridecyl benzene -- be accorded the same rates of duty.⁽⁵⁾ These companies argued that free entry of fatty alcohols would put Procter and Gamble, which uses this material, in a favourable competitive position compared to Colgate-Palmolive and Lever Brothers which use alkylate detergents (dodecyl benzene).

Lever Brothers, a manufacturer of surface-active agents based on alkyl phenols and dodecyl benzene, asked for rates of 15 p.c., B.P. and 20 p.c., M.F.N. on fatty alcohols on the grounds that "they are directly competitive with alkyl phenols."⁽⁶⁾

(1) Transcript, Vol. 40, p. 5916; Vol. 103, p. 15601

(2) Same, Vol. 103, p. 15602

(3) Same, Vol. 40, p. 5952

(4) Same, Vol. 52, p. 7833

(5) Same, Vol. 40, p. 5947

(6) Same, Vol. 103, p. 15495

In regard to end-use item 865 for fatty alcohols, the company noted:

"Our recommendation to the Tariff Board is therefore that end-use items specifying fatty alcohols be eliminated entirely, in which case they should bear the same duty as dodecyl benzene."⁽¹⁾

Chemical Developments of Canada Limited, another company using alkylate detergents, supported the request of Colgate-Palmolive and Lever Brothers, and stated:

"speaking on behalf of Chemical Developments (Canada) Ltd., our position is substantially the same as that which has already been given by Mr. McIlroy the spokesman for Colgate-Palmolive and Lever Brothers⁽²⁾."

The alkylates, if mixtures not specifically in the form of surfactants, would fall under B.T.N. heading 38.19, if individual chemicals, under heading 29.01 and if in the form of surface-active agents, they are classified in heading 34.02.

Nopco Chemical Canada Ltd. stated in its submission that higher fatty alcohols, although used as raw materials in making detergents, are also used directly in industry as surfactants. Because they are used as a final product, the company requested the abolition of end-use tariff item 865 and the extract of item 711 and recommended that higher fatty alcohols be imported duty-free regardless of use.⁽³⁾

The Continental Oil Company of Houston, Texas, U.S.A., stated that synthetic fatty alcohols were identical in use and properties to the natural products and could be used as direct replacements for natural fatty alcohols in detergent formulations; the company requested that:

"Synthetic fatty alcohols be included with fatty alcohols from natural sources, and be accorded duty free treatment until made-in-Canada."⁽⁴⁾

The company argued that it is of advantage to Canadian consumers of fatty alcohols to have duty-free entry on the synthetic as well as on the natural products. The present tariff items 865 and 711 Ex. are not specifically confined to either synthetic or natural fatty alcohols.

With respect to the surface-active agents which are the products of Canadian manufacture, the more relevant items under which imports would be entered are items 208t, (Free, B.P., 15 p.c., M.F.N.), 220a(i) and 711 (15 p.c., B.P. and 20 p.c., M.F.N.) 851 and 921, (duty-free under both Tariffs). Most imports are from most-favoured-nation countries and probably are subject to rates of either 15 or 20 p.c.

(1) Transcript, Vol. 103, p. 15500

(2) Same, Vol. 40, p. 5952

(3) Same, Vol. 103, p. 15533

(4) Same, Vol. 103, p. 15594

Almost all of the six submissions made jointly or individually asked for rates of 15 p.c., B.P. and 20 p.c., M.F.N. for the entire range of surface-active agents. The principal submission was made by nine companies which manufacture such agents. These companies estimated that they accounted for 75 per cent of the total Canadian production of surface-active agents.⁽¹⁾

Some of these companies also submitted individual briefs in the November 5, 1962 hearing on B.T.N. 34.02, Part 1, and supported the general submission or further amplified it. These companies included:

Procter & Gamble Company
Lever Brothers and Hart Products
Canada Packers Limited
Chemical Developments of Canada Ltd.
Nopco Chemical Canada Ltd.

The main proposals and arguments supporting these proposals are summarized below. It was stated in the general submission by the nine companies that:

"In this brief and others to follow, it is our intention to establish the need for a tariff structure in which all families of surface-active agents will be accorded duty levels of 15% B.P., 20% M.F.N. This recommendation is made on the basis that:

- "a) Essentially all surface agents are a family of products made in Canada. The others that may be produced in foreign countries are chemically identical, or directly competitive.
- "b) This level of rates is required in our opinion, taking cognizance of the economic factors in Canada, the competitive situation in other countries, the rate of new developments and the basic need for these materials.⁽²⁾
- "c) To enable Canadian producers to compete with imports, particularly those of U.S.A. producers who have many cost advantages, we believe duty of B.P. 15%, M.F.N. 20% is required."⁽³⁾

The submission further stated:

"The Canadian surface-active agent industry manufactures and sells every type of surface-active agent and is, we feel, able to meet all Canadian requirements for surface-active agents.

"We therefore believe that all surface-active agents must be considered made in Canada, or directly competitive with products made here. In a field as complex as this, there

⁽¹⁾ Transcript, Vol. 44, p. 6545

⁽²⁾ Same, Vol. 44, p. 6546-7

⁽³⁾ Same, Vol. 44, p. 6570

may be some specific exceptions to our general contention. We intend to discuss any exceptions as they are scheduled in the 29 series of items, and feel that in an area as subject to change and new development as this one, very careful study should be given to requests for lower duties before they are granted."⁽¹⁾

In view of the complex nature of the surfactant industry and its products, subject to constant change, the companies making the joint submission thus felt the need for "basket" rates to provide the required protection to the Canadian industry.

The arguments put forward in favour of the requested protection in the submission were:

- "a) Competition is keen and real. Foreign producers now enjoy approximately 55% of the industrial market and 25% of the total market.
- "b) Raw material costs in the U.S.A. are from 10% to 20% less than Canadian costs.
- "c) U.S. and U.K. producers have a further advantage of scale of production and its effects on yields.
- "d) Many U.S.A. and U.K. producers also make their own raw materials."⁽²⁾

Procter & Gamble Co. of Canada Ltd., the largest manufacturer of surface-active agents in Canada, principally based on alkyl benzene, alkyl sulphides and alkyl polyglycol ether sulphonates, supported the general submission, stating:

"We support the recommendations of the General Submission on Surface-Active Agents that the heading rates for Brussels Heading 34.02, part (1) and for those headings of Brussels Chapter 29 which provide for surfactants be 15% British Preferential and 20% Most-Favoured-Nation. Additionally, we believe that there is a sufficiently broad range of surfactants produced in Canada that all surfactants should attract heading rates of duty unless justified as specific exceptions."⁽³⁾

In support of the above proposal the company gave three arguments:

- "a) To protect our investment in surfactant manufacturing for the retail detergent business.
- "b) To protect our modest interest in the industrial surfactant business.

(1) Transcript, Vol. 44, p. 6547

(2) Same, Vol. 44, p. 6570

(3) Same, Vol. 102, p. 15385

"c) We believe that manufacturers of chemicals in Canada are entitled to moderate tariff protection to compensate for cost disadvantages and to provide an incentive to Canadian consumers to buy Canadian products."(1)

Lever Brothers Limited and Hart Products Co. of Canada Ltd., manufacturers and sellers of a diverse line of surfactants, reiterated and emphasized the position taken in the general submission of May 25, 1961, that the different products are all essentially competitive and should all attract rates of 15 p.c., B.P., 20 p.c., M.F.N., regardless of their location within the system of classification; the companies favoured the B.T.N. system of classification.(2)

Lever Brothers and Hart Products also recommended the elimination of end-use items which permit free entry or reduced rates of duty, and asked that any exceptions to the proposed rates be specifically named and apply only to products not made in Canada. As part of their observations on end-use items the companies said:

"We feel that many of the industries which have benefited by the use of end-use items are no longer infants requiring this protection and should now certainly be able to stand on their own two feet. We feel further that many end-use items, because of the way in which they are written and administered, have become much broader than was ever the original intention. As an example, we cite the duty-free importation of materials used in the manufacture of insecticides, which we feel was originally intended to benefit agriculture, but which is now applied to such items as aerosol sprays for killing flies in the house, and permits the duty-free importation of a household bleach. As a further example, Item [203a] permits the importation of a chemical that has been adapted for tanning or dyeing, but does not in any way limit its use to the tanning or dyeing industry. We feel many end-use items have outlived their usefulness and have not for years been used solely to benefit the industries for which they were intended. While we recognize that for some reasons it may be desirable to continue the use of end-use items, we strongly recommend that these be eliminated wherever possible."(3)

Canada Packers Limited, a manufacturer of several different families of surface-active agents, for use both in the company's production of household detergents and for sale for industrial use, agreed with most of the points in the general submission of May 25, 1961. In regard to tariffs the company recommended:

"Canadian producers must be able to compete with imports if the industry is to grow and develop. We are of the opinion that a duty of 15% B.P. and 20% M.F.N. is required on all Surface-Active Agents."(4)

(1) Transcript, Vol. 102, p. 15384

(2) Same, Vol. 102, p. 15423-4

(3) Same, Vol. 102, p. 15426

(4) Same, Vol. 102, p. 15453

Chemical Developments of Canada Ltd., a producer of a diverse field of surfactants, supported the general submission, and stated:

"Chemical Developments of Canada Limited respectfully submit that Canadian surfactant manufacturers are able to supply all Canadian requirements for surfactants and as all these materials are either made in Canada or are directly competitive with Canadian made products, a duty rate of 15% B.P. and 20% M.F.N. is essential if the development of this industry in Canada is not to be seriously impeded."(1)

Nopco Chemical Canada Ltd. and its subsidiary, Canadian Aniline & Extract Co. Ltd., producers of surfactants from higher fatty alcohols for sale to the manufacturers of retail detergents and for use in industry, supported the general brief submitted on May 25, 1961:

"On behalf of Nopco Chemical Canada Ltd., and its subsidiary, Canadian Aniline & Extract Co. Ltd., we propose that chemicals falling within the Group Heading 34.02, insofar as they relate to surface-active agents within the scope of the reference, be made dutiable at rates 15% B.P. and 20% M.F.N."

The company further stated that since the presentation of the general brief in May, 1961:

"competition in a number of the larger volume items in the United States in particular, has become even more keen with the tendency being for the manufacturer of raw materials in the form of simpler chemicals to enter himself into the production of either the final product or the more sophisticated intermediates. This has resulted in further price reductions on the United States market and has made it still more difficult for the Canadian manufacturer of surface-active agents to compete in view of his lower production volumes and higher raw material costs in general."(2)

No supporting data were provided by the company to illustrate the lower price trends or the extent of increased competition.

The Canadian Color Makers Association, a user of surfactants in the manufacture of pigments, did not raise any objection to the tariff proposals for surface-active agents made in Canada.(3)

Two parties expressed interest, as users of products of B.T.N. heading 34.02 and other B.T.N. headings; they were the Canadian Pulp and Paper Association and Naugatuck Chemicals Division of Dominion Rubber Company Limited. In general, the Pulp and Paper Association requested that there be no increase in rates of duty on materials used by its members. Naugatuck Chemicals took the general view that it would not oppose the rates of duty proposed by producers of materials it used provided that the Board also recommended the rates it would propose for the products made by Naugatuck.(4)

(1) Transcript, Vol. 102, p. 15458

(2) Same, Vol. 102, p. 15467-8

(3) Same, Vol. 102, p. 15451

(4) Same, Vol. 6, p. 900

Analysis of Proposals and Arguments

The main argument put forward by the companies in their general submission and in other joint and individual briefs and statements in support of duty rates of 15 p.c., B.P. and 20 p.c., M.F.N. was the higher costs of production of surface-active agents in Canada than in the United States. The higher costs were attributed to differences in scale of production, higher raw material and transportation costs, and the structure of industry.

Of all the factors stated as contributing to the differences in cost, the most important single factor mentioned was the higher costs of raw materials in Canada, which was said to amount to 10 to 20 per cent. The companies furnished the table, reproduced above in the section on the industry, to show the raw material components of certain selected surface-active agents and the cost differential in Canada and the U.S.A. The percentage differences in these costs and in the selling prices of the surfactants are given below.

<u>Surface-Active Agent</u>	<u>Per cent by which raw material costs are higher in Canada than in the U.S.A. (%)</u>	<u>Per cent by which Selling Price is higher in Canada than in the U.S.A. (%)</u>
Ethoxylated Nonyl Phenol 4 mols. E.O.	9.1	15.4
Ethoxylated Nonyl Phenol Sulphated (anionic)	11.8	23.6
Sodium Toluene Sulphonate	21.1	25.0
Sodium Xylene Sulphonate	20.7	31.2
Coconut Monoethanolamide	2.1	Nil
Dodecyl Benzene Sulphonate	3.4	14.3

The above table shows that the differences in raw material costs are not uniform, but on the average the six surfactants revealed a difference of 11.33 per cent. It is evident that the differences in selling prices are generally greater than those for the raw materials, averaging 18.4 per cent. Irrespective of the differences in cost of production and selling prices, however, the industry has asked for uniform rates of duty.

It is not known how far the above cost and price differences are representative of the surfactant industry as a whole, or what a complete analysis of all costs of production would reveal. However, the most widely produced surfactants are based on alkyl benzene sulphonates (ABS) or dodecyl benzene sulphonate for which the difference in raw material cost was only 3.4 per cent and the difference in selling price was 14.3 per cent. According to one source nearly one-

third of the surfactants used in the United States is based on alkyl benzene sulphonates;⁽¹⁾ possibly the same is true for Canada. Such a proportion would suggest that, on a weighted average basis, the difference in raw material costs between the two countries amounts to something of the order of 5 or 6 per cent and in selling price, of approximately 12 or 13 per cent.

In regard to the scale of production and the method of production, the Canadian surfactant industry very possibly suffers from disadvantage, though the continued expansion of the Canadian industry should assist in reducing the disadvantage, in part by permitting the installation of more advanced and automatic equipment adapted to longer runs.

Distribution costs and transportation costs are also difficult to assess and no attempt was made to arrive at an overall estimate of differences for these and other factors of cost, such as labour costs. In supplying much of the Canadian market, particularly in Central Canada, having regard also to costs of transporting the final product, Canadian producers undoubtedly do not invariably incur higher transportation costs.

Data on imports of surface-active agents are given in Appendix I. Because of the changing import statistical classifications, import statistics are not available on a consistent basis. The value of identifiable imports of surfactants has been approximately \$5 million in recent years; in addition, \$3 or \$4 million of imported cleaning preparations were said to consist chiefly of surface-active agents. These data suggest that some 20 per cent of Canadian requirements of surfactants are imported. It is not known what the average rate of duty would be for these imports, but many would enter under tariff items which provide a protection of 15 or 20 p.c. Some of the imported products are of a kind not made in Canada and, although producers in Canada submitted that domestic products were substitutable for all or most imported products, some imported products are specialty types for which the market was said to be too small for Canadian production; some also are new formulations for which a sufficient Canadian market has not developed to warrant production in this country, or which are incorporated, in some cases by the companies themselves, into formulations in this country. It is, therefore, not certain what the net gain to the producers would be from the proposed uniform application of rates of 15 p.c., B.P., 20 p.c., M.F.N., but it could hardly result in major reductions in their costs of production and selling. Imports from British preferential countries, in particular, were not represented as a significant factor in the Canadian market.

(1) Chemical Week, May 22, 1965, p. 20

SURFACE-ACTIVE PREPARATIONS AND WASHING PREPARATIONSThe Products

The first part of the report on heading 34.02 dealt with surface-active agents; this part deals with mixtures and preparations based on surface-active agents, as well as with washing and cleaning compounds. Mixtures and preparations of surfactants are known in commerce as synthetic detergents and are used in households and by industry. These products are mixtures of two or more chemicals and are used for laundry, dishes, floors, walls, tiles, and other household cleaning and for a large variety of purposes in industry such as the degreasing of textiles to facilitate dyeing or bleaching, degreasing metals, cleaning of buildings, tanks, dairy equipment, in the tanning of leather and as additives in surface coatings, lubricants, pesticides and other products. Such preparations are sold by brand names, though in some industrial applications attention is paid more particularly to specifications. A more complete description of the goods is given under tariff considerations below.

These products can be in the form of powders, granulars, liquids or pastes, and are sold in small packages at retail or in bulk to industries. The difference between household detergents and industrial detergents is often based simply on the size of the package. Detergents sold as liquid or paste in packages of less than one gallon are considered, in the trade, as household and in larger packages, as industrial. Similarly, powders in packages of less than 25 pounds are typically regarded as household, and in larger packages, as industrial.

Although the detergents sold at retail for household use and in bulk for industrial are often more or less the same products, using the same raw materials and the same processes of production, a distinction is made because of the marketing considerations such as differences in packaging costs, labelling and advertising costs.

This part of heading 34.02 also includes other washing and cleaning preparations, for example those based on sodium carbonate decahydrate (washing soda), sodium metasilicates and the sodium borates. The preparations also include those based on synthetic solvent-soluble detergents and spotters used in the dry cleaning industry, based on benzene soaps, petroleum sulphonates, or dark soaps, synthetic sulphonates (the amine salt of dodecyl benzene sulphonate) or light soaps; these are used for both batch and charge processing in the dry cleaning plants. The spotters are concentrated, manufactured surface-active agents and/or soaps mixed with solvents having dissolving properties additional to those of the solvents in the normal dry cleaning system. The composition of this type of product differs widely with the type of stain to be removed. Also included are blended alkalies used in dairies for washing bottles. These are washing preparations, specifically used for cleaning; they are often based on inorganic alkalies, but may contain organic products.

The commercial significance of the products covered by this section of the report is in the neighbourhood of \$100 million a year; more than two-thirds is sold at retail.

In contrast to the individual surface-active agents, synthetic detergents and washing compounds are prepared to perform a specific purpose under specific conditions. In Canada, the following categories of retail detergent preparations were reported to be formulated to produce optimum results for the purpose specified.

1. Granular Heavy Duty Detergents - designed for heavy duty cleaning of washable fabric such as cotton.
2. Granular Light Duty Detergents - designed for cool water washing of delicate fine fabrics, and for dishes.
3. Liquid Light Duty Detergents - designed for dishwashing and fine fabrics.
4. Liquid Heavy Duty Detergents - designed for heavy duty cleaning of washable fabrics.
5. Heavy Duty Automatic Laundry Products - designed to provide the low sudsing necessary in some types of automatic washers.
6. Hard Surface Cleaners (Liquid and Granular) - designed to give heavy duty cleaning and low sudsing when cleaning surfaces such as floors, walls, tiles, etc.
7. Automatic Dishwasher Products - designed to provide no suds and good cleaning under turbulent conditions in automatic dishwashers.
8. Specialty Cleaning Products - broad variety of small volume specialties such as waterless hand cleaners, metal cleaners, toilet bowl cleaners, etc.

Industrial detergent products are, in general, even more specific to the conditions of use although some products have a broader range of uses. Industrial forms of the detergent preparations listed under most of the above categories are manufactured. In addition, the following industrial categories are of significance.

9. Textile Specialties - designed to facilitate manufacture of fabrics and to improve their finished qualities, e.g. wool oils, fabric softeners, anti-static agents, etc.
10. Tanning Specialties - designed to facilitate the tanning of leather.
11. Institutional Specialties - designed specifically for the cleaning and maintenance methods used in large institutions such as hospitals.
12. Dairy Specialties - designed specifically for the cleaning of commercial and farm dairy equipment.

The above categories of products include synthetic detergents, washing preparations and cleaning compounds based on organic surface-active agents.

Some of the detergent products contain alcohol; three-quarters of the liquid detergents on the market was estimated by one spokesman to contain alcohol.

Detergents are a development beyond traditional soaps but are generally produced by the same companies. As in the case of surface-active agents, the commercial production of detergents was undertaken after World War II, although plants producing soaps were established in Canada as early as the 1890's. Lever Brothers Limited set up its first soap plant in Toronto in 1898. Because of the superior performance of organic surface-active preparations, especially in hard water, they have rapidly displaced soap and soap products. Their increasing popularity both in industrial and in household uses has led to their large-scale production in Canada. Although detergents were first introduced into industrial uses, today, in terms of value, household use predominates.

Raw Materials and the Process of Manufacture

The principal raw materials used in the manufacture of detergents are the surface-active agents discussed in the previous part of this heading. In addition, a large number of chemicals are used to make a specific contribution to the total function. A selective list of these chemicals is: ⁽¹⁾

Sodium tripolyphosphate	Carboxymethyl cellulose
Tetrasodium pyrophosphate	Fabric brighteners
Trisodium phosphate	Alcohols
Tetrapotassium pyrophosphate	Essential oils
Sodium sesquicarbonate	Sodium perborate
Soda ash	Hydrotropes
Sodium silicate	Sodium sulphate
Sodium metasilicate	Caustic soda
Borax	

The more important ones in use were stated to be the silicates, phosphates, caustic potash and carboxymethyl cellulose. The most important single chemical, apart from the alkyl benzene surfactant, is sodium tripolyphosphate, used as a base for surface-active agents.

From the above list, the chemicals which are made in Canada are sodium tripolyphosphate, tetrasodium pyrophosphate, trisodium phosphate, soda ash, sodium silicate, sodium metasilicate, carboxymethyl cellulose, alcohols, hydrotropes, sodium sulphate and caustic soda.

(1) Transcript, Vol. 141, p. 21007

The phosphates are made by the Electric Reduction Company; soda ash by Allied Chemical Canada Limited; sodium silicate and sodium metasilicate by National Silicates Limited; carboxymethyl cellulose by Chemical Developments of Canada Limited; the alcohols by Commercial Alcohols Limited, Consolidated Alcohols Limited and Reliance Chemicals Limited; the hydrotropes by Hart Products of Canada; sodium sulphate by Courtaulds (Canada) Limited; caustic soda by a number of firms, including C.I.L., Standard and Dow Chemical.⁽¹⁾

The paper used for packaging retail detergents -- powder or granular -- is of special type, known as kaolin, a pure white grade designed to retain its white appearance. For liquid detergents, bottles of glass or plastic are commonly used, and plastic bottles are supplying an increasing share of the requirements.

For the most popular detergent, 95 per cent of chemical raw materials and packaging materials were said to be produced domestically.⁽²⁾

In the manufacture of dry cleaning detergents, two basic petroleum-derived solvents are commonly used. Chemicals used in blended alkali washing compounds consist chiefly of anhydrous caustic soda and alkali salts.

The manufacture of detergent preparations requires a significant capital investment and extensive technical knowledge. Typically, the stages involved in the process are the manufacture of the basic surfactants, blending of the formula ingredients, conversion into the desired physical form of finished preparations and, finally, packaging of the various forms of finished preparations. The manufacturers of detergents also produce most of their requirements of surface-active agents.

As detergents are made in a variety of physical forms -- powders, granules, liquids -- different processing procedures are required; some of the major operations are as follows:

- a. Crutching (blending in paste form) and spray drying for granular preparations.
- b. Liquid blending of liquid preparations.
- c. Dry blending of granular preparations.

Packaging is done by automatic operations such as automatic carton forming and granule or powder filling, and automatic bottle filling.

In the case of dry cleaning detergents, the manufacturing operation involves adding the organic solvents to solvent soluble detergents.

⁽¹⁾ Transcript, Vol. 141, p. 21065-6

⁽²⁾ Same, Vol. 142, p. 21144

For blended alkalies, which are chiefly mixtures of anhydrous caustic soda fused with other alkali salts to various proprietary formulae, the process of manufacture was outlined by the spokesman for C.I.L. as follows:

"Caustic soda is produced in liquid form in the plant. It goes to a concentrator where the moisture is removed. Then for the blended alkali manufacture the liquid caustic soda goes to what we call a pot. It holds 16 tons as a charge, and these pots are fired by fuel oil at high temperature. Then the other chemicals that we add are added in there, and the whole mixture is fused. So that you are limited to the products that you can add there by the melting point. You cannot add any organic products, just some of these inorganic salts.

"Then this blended alkali is competing with mixtures which are made, taking caustic soda in the dry form, and you add other additives and compounds of various sorts as a mixture. You do not get such a uniform product because you may have a different size mesh product which is added, where as in the blended alkali the product is so fused, it all evenly disperses and it is flaked."(1)

The Industry

As mentioned earlier, synthetic detergents are produced by companies also engaged in the production of soap and cleaning compounds. According to the D.B.S. there were, in 1962, 137 firms in Canada primarily engaged in manufacturing soaps, synthetic detergents, cleansers, washing powders and cleaning preparations including scouring powders, hand cleaners, household laundry bleaches and blueing, and also toilet preparations. It was estimated by four companies which made a joint submission that 40 per cent of their total production was in detergents. It was also stated that detergent preparations formed 55 per cent of the value of factory shipments of the soap and cleaning compounds industry, and the four companies presenting the composite brief accounted for three-quarters of the entire shipments of the industry. The four companies estimated that they supplied 90 per cent of the Canadian market for detergent, cleaning and washing preparations classified by B.T.N. 34.02 (Part II).(2) On the basis of these estimates and the D.B.S. data, it would appear that shipments of synthetic detergents and related preparations have amounted to more than \$90 million in recent years, and shipment of detergents by the four companies, therefore, to more than \$80 million.

The detergent industry may be considered also in terms of the type of production activity carried on by the firm. Some firms manufacture their major surfactant raw materials and produce from these a broad range of detergent preparations. The four companies of the joint brief, Canada Packers Ltd., Colgate-Palmolive Ltd., Lever Brothers Ltd. and Procter and Gamble Co., belong to this group. They

(1) Transcript, Vol. 143, p. 21385

(2) Same, Vol. 141, p. 21001, 21013, 21031

sell final products primarily to the retail market and relatively small quantities to industrial users. The second group within the industry consists of manufacturers of a broad range of surfactants, who sell surfactants and detergent preparations made from these to industrial consumers. The third group includes firms which simply blend and package purchased materials and sell the finished product for retail or institutional use.

Because of the variety of products produced by the soap companies, data on the consumption of raw materials, wages, investment and profits for synthetic detergents are not available separately.

The four companies submitting the composite brief furnished the Board with a list of firms indicating those engaged in the production of retail preparations, industrial/institutional preparations, or both, falling within the scope of this part of Brussels heading 34.02. The list included 94 firms, 15 manufacturing retail preparations, 46 industrial/institutional preparations, and 33 both. The companies' list is reproduced in Appendix III.

Because of the relatively large population and industrial concentration in Ontario and Quebec, the industry is mostly confined to these provinces, with most of the retail detergents produced at three centres, Toronto, Hamilton and Montreal. Of the 94 firms reported to be engaged in the production of detergent preparations and washing and cleaning compounds, 58 were located in Ontario and 26 in Quebec. Manitoba had 3 firms, Alberta 2 and British Columbia 5.

The value of factory shipments of surface-active preparations (synthetic detergents) and washing compounds for the years 1958 to 1964 is given in the table on the following two pages.

The synthetic detergents and washing compounds industry has been a rapidly growing industry in Canada, and its production rose from \$71 million to more than \$92 million or by about 30 per cent in the course of the five years from 1958 to 1963. In 1963, the latest year for which complete data are available, factory shipments of household detergents and washing compounds accounted for over 70 per cent of total shipments. The rate of increase, however, has been more rapid for industrial detergents. The increase for household detergents was close to 20 per cent during the period 1958-1964; for the industrial detergents, the increase was close to 100 per cent, with industrial liquid detergents showing the largest relative gain, rising from about \$650,000 in 1958 to \$4,182,000 in 1964, an increase of nearly 600 per cent. The growing popularity of this type of detergent was accompanied by lower prices. Since 1964, industrial detergents undoubtedly have continued to advance appreciably but possibly at a slower rate.

Factory Shipments of Surface-Active Preparations
(Synthetic Detergents) and Washing Compounds, Canada,
1958-64

Product	1958	1959	1960	1961	1962	1963	1964
			- thousand dollars -				
I. <u>Surface-Active Preparations</u> (Synthetic detergents)							
Household (Retail)							
Liquid (and paste) Package - in individual containers of less than 1 gallon	11,500	14,473	14,675	15,643	19,059	18,895	20,574
Solid - Packaged - bar or carton of 25 lb. or less	42,131	41,679	42,829	43,117	43,006	42,238	43,237
Total Household	53,631	56,152	57,504	58,760	62,065	61,133	63,811
Industrial							
Liquid - Bulk - in individual containers of 1 gallon or more	650	1,180	2,527	2,733	4,895	5,084	4,182
Solid - Bulk - individual bars or cartons of more than 25 lb.	2,427	2,612	3,394	3,789	3,988	6,458	5,632
Textile & Leather Specialties	4,346	3,699	4,188	4,957	4,956	5,000	5,000
Other	400	450	491	500	500	500	500
Total Industrial	7,823	7,941	10,600	11,979	14,339	17,042	15,314

(Cont'd)

II. Washing Preparations

	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
			- thousand dollars -				
(a) Household and Laundry	872	836	1,058	1,411	1,567	2,544	..
(b) Industrial and other	1,950	1,786	1,786	1,939	3,830	2,364	..
(c) Other washing compounds	<u>1,905</u>	<u>2,221</u>	<u>3,310</u>	<u>3,541</u>	<u>4,204</u>	<u>4,236</u>	<u>..</u>
Sub-Total	4,727	4,843	6,154	6,891	9,601	9,144	..
<u>Shipments from other Industries</u>							
(a) Toilet bowl cleaner (Retail)	653	584	669	813	1,112	1,140	..
(b) Unclassified	<u>4,000</u>	<u>4,000</u>	<u>4,177</u>	<u>4,200</u>	<u>4,200</u>	<u>4,200</u>	<u>..</u>
Sub-Total	4,653	4,584	4,846	5,013	5,312	5,340	..
Total Shipments	70,834	73,520	79,104	82,643	91,317	92,659	..

Source: Transcript, Vol. 141, p. 21021 for 1960; other years based on D.B.S., Manufacturers of Soap and Cleaning Compounds, Cat. No. 46-214, 46-216, 46-003

Although the detergent industry has developed at a rapid pace during the past few years and detergents have replaced soaps in various uses, it is now faced with the problem of foamed sewages and water streams, resulting from the use of "hard", non-biodegradable detergents mostly based on alkyl benzene sulphonate (ABS). In certain countries legal stipulations are being laid down to require the use of "soft" detergents with biodegradable properties. The industry, therefore, is in the process of experimenting in the development of a new range of products based on linear alkyl sulphonates (LAS) and alkyl-phenols - straight chain alcohols. The effects of this development cannot be assessed in terms of future Canadian production of detergents, surface-active agents or their raw materials, or the impact of imports on the Canadian market. No information was brought to the Board's attention to suggest that the industry anticipated any major change in its competitive position because of new products.

As compared with the detergent industry in other countries, particularly the U.S.A., the Canadian industry was said to suffer from certain cost handicaps because of small scale production, widely scattered markets, the high cost of materials - chemicals and packages - and the lack of integration in the production process.

Transportation Costs and Location of Plant

In regard to the widely scattered market and the concentration of the detergent industry in Central Canada, it was stated at the public hearing that there are thousands of customers for detergents packaged for retail sale, and these are located right across Canada. However, economies in production were said to be best realized only when the entire market was served from a single plant, rather than from smaller plants set up in different locations. For example, even after paying the transportation costs, a producer in Toronto was said to be able to supply the product to Vancouver more cheaply than if he were to put another plant there. Largely as a result of these factors, distribution costs in Canada were said to be higher by 15 per cent than those for producers in the U.S.A.

Costs of Production, Size of Market and Scale of Production

On the cost of production, as it is influenced by the size of the market and the scale of production, the following comment was made.

"The size of the Canadian market imposes very real limitations on our cost structure. Our population is only one tenth of that of the U.S.A. and per capita consumption of our products in Canada is 30% lower. This means that our manufacturing operations are on a smaller scale than those south of the border. As an example, our synthetic granule production unit produces at one half the production rate of standard units used by our parent company in the United States.

"This is brought about by the fact that Canadian consumers desire the same kind and type of products that are sold in the United States. This causes real complications in that we only have two synthetic towers producing 4 different synthetic formulations in four different colours. This means

constant shut downs for clean-out as we change from one brand to the other, whereas in the United States an item like 'Tide' will be blown six days a week 24 hours a day on one colour, thus getting maximum efficiency and the lowest possible cost."(1)

And another spokesman noted that:

"in a large detergent plant you might produce one hundred and eighty to two hundred and fifty different packs in a year.

"In the matter of the costs of short runs your equipment has to be changed over to put another size on; the towers must be cleared out to change colour. The small producer in the liquid field is only making one or two products, possibly four or five - for a chain store. This is much simpler to do. In fact, the smaller producer has longer runs than we have relatively."(2)

For industrial detergents in particular, the small scale of production contributed to the higher overhead costs and the short production runs.

Costs of Raw Materials

On chemical materials and packaging materials, costs in Canada were said to be higher than in the U.S.A.

"Chemical raw materials and packaging materials cost more in Canada than south of the border. This is not surprising for we buy from Canadian firms with cost disadvantages similar to our own. We cannot achieve the economies of very large volume buying for our requirements are less. U.S. detergent producers have integrated backwards in many instances, and are able to very economically produce many of their raw materials. The smaller scale of Canadian operations made this type of investment much less attractive in Canada. While chemical raw materials do cost moderately more, and by this I mean in the vicinity of 15%, our paper board packaging materials are even higher relative to U.S. costs. These costs represent a very significant portion of our total costs and are a major reason for our higher costs in Canada."(3)

It was also said that,

"total Canadian raw material costs per unit or product range from 20% to 35% higher than the costs of raw materials for similar products incurred by producing plants in the United States.

(1) Transcript, Vol. 141, p. 20972

(2) Same, Vol. 142, p. 21196

(3) Same, Vol. 141, p. 20972

"Packaging material for individual products in the sample ranged from 8% to 45% higher per product in Canada than they would cost at detergent preparations manufacturers' plants in the United States."(1)

High Advertising Costs

In regard to the higher advertising costs in Canada, it was noted that:

"We also have an advertising inefficiency in that we make one T.V. commercial, for example, in English. We then have to repeat the entire job to cover the French market with a corresponding effect on costs, this versus the U.S. where the same commercial, costing only slightly more, can be effectively used against a 185 million market."(2)

Some Advantages of the Canadian Industry

While several factors were mentioned as contributing to the higher relative costs of producing and marketing detergent products in Canada, two factors were cited as tending to produce lower costs in Canada than in the U.S.A.; these were labour costs and research expenses. However, with respect to labour costs, a spokesman pointed out that, per unit of output, they might not be less in Canada. With respect to research costs it was noted that in Canada the proportion of the cost of technical research to the selling price of the product is lower than in the United States because the basic research is not carried out in Canada.

Considering all the cost advantages and the disadvantages, a spokesman concluded that production costs in Canada are higher than in the U.S.A. by 15 to 20 per cent. The Board did not conduct the extensive investigations necessary to assess the accuracy of this estimate.

The Canadian Market

The market for washing and cleaning products has shown a considerable change since World War II. With the development of automatic washing machines and the popularity of synthetic detergents in hard water, the market for detergents has witnessed a sharp increase, while the market for soaps has declined substantially. The changing structure of the market from soaps to synthetic detergents, and the growing use of the latter, is evident from the following table.

(1) Transcript, Vol. 142, p. 21138-9

(2) Same, Vol. 141, p. 20973

Production of Soaps and Detergents
and their Percentage Distribution,
1952-63

<u>Year</u>	<u>Soaps</u>		<u>Synthetic Detergents</u>	
	<u>Production</u> million lb.	<u>Percentage of</u> total soap & detergent production %	<u>Production</u> million lb.	<u>Percentage of</u> total soap & detergent production %
1952	196	69	87	31
1953	182	61	115	39
1954	165	57	122	43
1955	157	53	138	47
1956	154	50	156	50
1957	142	45	177	55
1958	137	41	198	59
1959	130	38	210	62
1960	110	32	230	68
1961	125	34	247	66
1962	116	29	279	71
1963	113	27	307	73

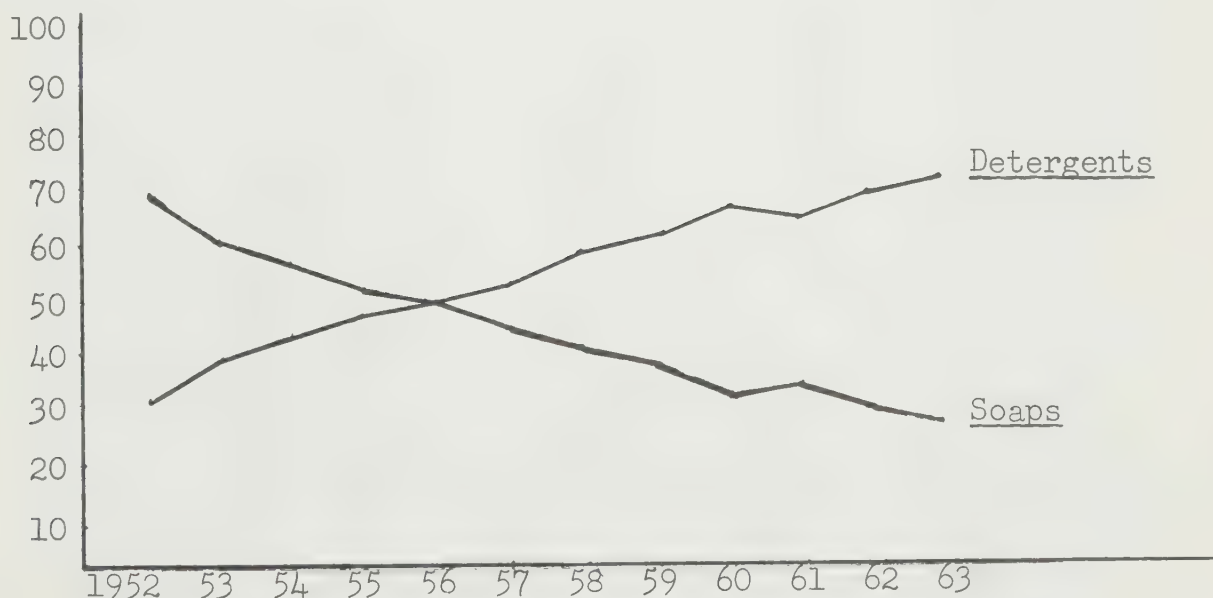
Source: Based on D.B.S., Manufacturers of Soap and Cleaning Compounds,
Cat. No. 46-214

Thus, in the twelve years, 1952 to 1963, the respective shares of the market served by soaps and by detergents reversed, as soaps dropped from 69 per cent to 27 per cent and detergents increased from 31 per cent to 73 per cent. The trend in favour of detergents, however, while continuing, appears to have moderated in the past few years

The following graph shows the ratio of the market served by soaps and detergents during the twelve year period.

Production of Soaps and Detergents,
Percentage Distribution, 1952-63

Percent



In 1960, according to the joint submission by the four companies, Canadian requirements of detergent preparations, washing and cleaning preparations were approximately \$80 million, about \$76 million of this market was supplied by domestic manufacturers and the remainder was imported; thus imports were supplying about 5 per cent of Canadian requirements, a share that has been tending to decline in recent years.

The companies further estimated that of the \$76 million value of Canadian factory shipments, \$64 million was put up in packages suitable for retail sale and \$12 million was meant for industrial or institutional sale. Of the imported detergents, they estimated that one half was retail detergents and the other half brand name preparations for industrial use.⁽¹⁾

The following table shows the Canadian market for synthetic detergents, washing preparations and cleaning compounds, from 1958 to 1964.

As indicated earlier, the market for synthetic detergents, washing and cleaning preparations is growing rapidly toward \$100 million annually. During the past four years from 1960 to 1964, it has grown from just over \$83 million to about \$97 million, an increase of 17 per cent, or over 4 per cent per year. The household detergent market in 1964 was of the order of \$64 million and the industrial market, \$15 million, the former roughly four times the size of the latter. Washing, cleaning and similar preparations had a value of approximately \$18 million in 1964.

By type of product, in the above groupings, the largest relative increase during the four years from 1960 to 1964 was in washing preparations, about 62.5 per cent, followed by industrial detergents, more than 44 per cent. Although the market for industrial detergents and washing preparations has shown a marked increase, household detergents still accounted for more than 60 per cent of the total preparations used in Canada.

(1) Transcript, Vol. 141, p. 21011

Estimated Market for Synthetic Detergents,
Washing Preparations and Cleaning Compounds,
Canada, 1958-64

Type of Product	1958	1959	1960	1961	1962	1963	1964
				thousand dollars	-		
<u>Domestic Production</u>							
Household detergents	53,631	56,152	57,504	58,760	62,065	61,133	63,811
Industrial detergents	7,823	7,941	10,600	11,979	14,339	17,042	15,314 (a)
Washing preparations	4,727	4,843	6,154	6,891	9,601	9,144	10,000 (a)
Shipped from other industries	4,653	4,584	4,846	5,013	5,312	5,340	5,000 (a)
Total Domestic	70,834	73,520	79,104	82,643	91,317	92,659	94,125 (b)
<u>Imports</u>							
Detergents, powder & liquid	..	..	1,200	..	1,319	1,017	829
Washing & cleaning preparations (c)	..	..	2,800	..	3,739	3,891	2,888
Total Imports	..	..	4,000	..	5,058	4,908	3,717
<u>Exports (d)</u>							
Apparent Canadian Market		(Negligible)		612	775	901	1,094
	..	..	83,104	..	95,600	96,666	96,748

- (a) Estimated on the basis of previous years
 (b) Based on monthly surveys not directly comparable with data for previous years
 (c) Includes cleaning compounds, reported to be surface-active agents
 (d) Includes some soap, polishing preparations and household chemicals

Source: D.B.S., Cat. No. 46-214 for years 1958-1962; Cat. No. 46-003 (monthly), 1964

The per capita consumption of household detergents in Canada was stated to be 30 per cent less than the United States. Some of the factors contributing to this smaller consumption were thought to be lower per capita income in Canada, the higher prices of detergents in Canada and greater use of automatic washing machines and commercial laundries in the U.S.A.

Among the salient features of the Canadian detergent market are the heavy cost of distribution and advertising and the relatively small amount of domestic research and development of new products. Distribution cost was estimated to be 5 to 10 per cent of the selling prices, and includes a relatively heavy incidence of warehousing facilities.

The geographical distribution of the market for detergents in Canada differs product to product, but for a representative sample of the products it was said to be about 60 per cent in Quebec and Ontario, 20 per cent in the Prairie Provinces, 12 per cent in British Columbia, with the remainder in the Atlantic Provinces.

In regard to the concentration of the market it was stated:

"Some two-thirds of the available Canadian market is concentrated in the 800 miles between Quebec City, Quebec and Windsor, Ontario, while the other one-third is located on relatively small pockets at long distances from the main market and manufacturing area.

"at least one third of the Canadian market is closer to large manufacturing centres in the United States than to Canadian manufacturing areas.

"it is pretty clear that the Maritimes are all closer to Boston and New York; Chicago is closer to the prairie provinces; and the California plant cluster is closer to Vancouver and Victoria than we are, by a good deal."(1)

The principal source of competition in the Canadian detergents market is domestic, with foreign competition mostly confined to incursions resulting from new price reductions or from new product developments. In the industrial field it was stated that the external competition is more acute than in the household field.

(1) Transcript, Vol. 142, p. 21140-1, 21200

As mentioned earlier, detergents are sold in the market by brand names, and it was stated in this connection that the concept of brand marketing developed over the last 25 or 30 years is relatively highly developed in the detergent business.

In regard to dry cleaning detergents and spotters, no market information is readily available. Similarly for blended alkalies little information is available on a public basis.

Foreign Trade

Foreign trade in detergents and washing preparations has been quite insignificant compared to domestic production and consumption of these commodities. Imports have been predominantly from the United States and exports in small quantities were stated to be to the West Indies. Exports are small partly because the companies manufacturing detergent products in Canada also have manufacturing affiliates established in other countries.

Prior to 1962, statistics on imports of synthetic detergents were not available separately, being included with imports of surface-active agents and other products of similar nature. Imports of synthetic detergents and washing and cleaning preparations from 1962 to 1964 are given below.

Imports of Detergents, Powder or Liquid, 1962-64

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>
	lb.	\$	<u>Value</u> \$/lb.
	<u>Total</u>		
1962	6,126,185	1,318,916	.22
1963	5,119,163	1,017,465	.20
1964	4,217,837	828,695	.20
	<u>United States</u>		
1962	6,125,206	1,317,933	.22
1963	5,111,091	1,014,600	.20
1964	4,203,071	821,090	.20

Source: D.B.S., Trade of Canada, Imports, s.c. 8245 (1964, s.c. 800-68)

Imports of Washing and Cleaning Preparations, 1962-64

<u>Year</u>	<u>Total Imports</u>	
	lb.	\$
	<u>Total</u>	
1962	..	3,738,555
1963	..	3,890,893
1964	..	2,887,667
	<u>United States</u>	
1962	..	3,722,111
1963	..	3,836,802
1964	..	2,860,997

Source: D.B.S., Trade of Canada, Imports, s.c. 8246 (1964, s.c. 800-73)

Not only do imports constitute a very small portion of the Canadian market, but they are also declining. It was stated in the public hearing by a spokesman for the companies making the joint submission that:

"We have a little more information on the trend of imports than we have included in our brief, but it is not very much. In Appendix B to our brief and Appendix C we have listed imports from the U.S.A. from 1957 to 1962. I would say that these indicate a growing trend of imports from 1957 to 1960, which has levelled off in 1961 and perhaps decreased in 1962 as a result of devaluation."(1)

The data submitted in the appendix referred to, based on U.S. export data, showed annual exports to Canada of about 27 million pounds of detergents and surface-active agents, valued at approximately \$4 million in the years 1958 to 1961, with specialty cleaning and washing compounds adding an additional 15 to 20 million pounds each year, valued at \$3 to \$4 million. Although most of the imports were of specialty items and new products, before 1961 some products, for example liquid detergents, were said to be imported because of low prices. The spokesman for the four companies stated:

"There were imports of very cheap liquid detergents which ended in about 1961, and these were very cheap. They were priced under what was offered in Canada. That was the reason, or one of the reasons for their existence."(2)

At another stage in the public hearing, it was stated:

"For about three years [prior to 1962] there was a period when liquids were coming into this country in considerable volume under conditions which you had to meet in some way or another."(3)

(1) Transcript, Vol. 141, p. 21082

(2) Same, Vol. 141, p. 21083

(3) Same, Vol. 142, p. 21170

Information on exports of detergents and cleaning compounds is not available separately. However, over the past five years, exports, particularly of cleaning compounds and related products, have shown an increasing trend; total exports rose from \$39,000 in 1960 to over one million dollars in 1964. Increases in exports to Commonwealth countries were more marked than to others.

Exports of Soap and Detergents, Cleaning and
Polishing Preparations and Household
Chemical Specialties, 1960-64

Type and Country	1960	1961	1962	1963	1964
			- dollars -		
(a) Soap and Detergents					
Total	38,977	122,849	102,354	185,573	203,741
United Kingdom	*	36,732	25,537	83,140	101,999
United States	6,325	27,411	42,301	46,975	27,703
Trinidad & Tobago	18,362	2,740	8,085	9,601	15,433
Jamaica	1,552	12,000	5,808	9,166	2,515
Barbados	4,260	3,161	4,569	4,513	4,297
Cuba	-	18,729	-	-	15,013
(b) Cleaning & Polishing Preparations and Household Chemical Specialties					
Total	..	488,689	672,966	714,525	890,285
United Kingdom	..	9,194	8,903	59,565	152,986
United States	..	366,311	380,278	337,917	347,327
Trinidad	..	18,807	26,634	9,601	62,053
Australia	..	8,855	38,321	38,856	51,585
Sweden	..	-	-	-	34,686
Cuba	..	31,191	67,959	9,272	14,814
Total (a) and (b)	..	611,538	775,320	900,148	1,094,026

Data include re-exports, except for 1964

Source: D.B.S., Trade of Canada

Despite the fact that imports have been declining and exports rising, imports exceeded exports by more than \$2.5 million in 1964.

Prices and Pricing Policy

No public information was submitted to the Board on prices of detergent preparations or washing compounds. However, on the basis of the confidential information available to the Board, it is evident that the prices of household detergents have levelled off in the past few years and the increase if any has been less than for consumer goods prices in general. The trend of prices for industrial detergents was reported to be downward.

Product differentiation is attempted primarily by use of brand names, advertising, packaging and display. In order for these techniques to be successful, at the retail level, prices of products similarly presented to the buyer generally must be kept at much the same level. General consistency at the retail level across Canada, particularly because products are packaged at a central location, is facilitated by quoting, on a delivered basis, the same price coast to coast. Bulk quantities are priced somewhat lower than those packaged for retail sale.

In addition to the competition from similar products of other domestic producers, the companies noted the competition from the U.S.A.

"In evaluating the special problems of manufacturing and selling household products in Canada, there is a special characteristic element of major importance to be considered, i.e. the proximity of the United States. The physical juxtaposition of the two countries, the effects of which are magnified by the physical integration of our transportation and communication systems with the great influx into Canada of United States advertising media, creates many conditions that make the Canadian market peculiarly vulnerable to United States based competition. It is for this reason that the comparisons made in this presentation are primarily between costs in Canada and the United States."⁽¹⁾

As noted above, imports do not supply a large part of the market.

No price data were said to be available for detergents used by the dry cleaning industry. The spokesman for Dye and Chemical Co. of Canada. Ltd. stated:

"It has up to this time been impossible for us to find out what the prices of U.S. materials in the U.S. are. These prices of materials which we believe have been imported into Canada are competitive with our prices."⁽²⁾

In regard to blended alkalies, the spokesman for C.I.L. stated:

(1) Transcript, Vol. 142, p. 21140

(2) Same, Vol. 143, p. 21380

"One of our distributors is a manufacturer in the United States, and we judge from the price at which we were selling them that certainly prices in the United States must be very comparable with what they are here. We had to make an adjustment in our selling price or we would have lost the business. They would have imported the material from their own American producer, their own parent company."(1)

In regard to liquid detergents, an indication of competitively lower prices was given in a trade publication.

"On the consumer level, Mir (Myriad) has carved out a position through a lower price (1.9¢/oz). CP's Maple Leaf and CDC's Gay have gained sales at 2-3¢/oz. while Lever's Lux, Colgate's Ivory, and P & G's Joy have usually sold above the 3¢/oz. level."(2)

These prices would indicate a price of about 30 cents to 48 cents a pound for liquid household detergents.

Transportation

As the prices of detergent preparations are on a delivered basis and it is the policy of the detergent manufacturers to maintain similar prices across the country, the question of transportation is of importance to the detergent industry, especially when products have to be transported to areas an appreciable distance from the production centres concentrated around Toronto and Montreal. As a consequence of the long distances involved and the time consumed in the transportation of products, large warehouse facilities are maintained in various parts of the country. In addition to the long distance and the need for extra warehouse facilities, the necessity to package a large proportion of production in bulky retail containers of relatively small net weight adds to transportation, storage and handling costs. The question of transportation is of more significance in the case of household detergents than industrial detergents. As has been noted, the reduction of transportation costs by establishing plants in other locations was said to be outweighed by the consequent loss of economies of scale.

As mentioned earlier, about two thirds of the Canadian detergent and washing compounds market is in Ontario and Quebec; it is on the remaining one third that the heaviest transportation costs naturally are borne, though it is understood that, at times, some part of this may be covered by an additional charge. The necessity to absorb heavy transportation costs makes the Canadian producer more vulnerable in the more distant market areas to incursions from plants more favourably located across the border. On the other hand, as the accompanying table demonstrates, over much of the Canadian market transportation costs worked in favour of the producer in Canada.

(1) Transcript, Vol. 143, p. 21388

(2) Canadian Chemical Processing, June 1964, p. 71

Comparison of Freight Costs from Canadian Plants and U.S. Plants to Selected Destinations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>Destination</u>	<u>Cdn. ex Works Cost</u>	<u>Freight Toronto to Destination</u>	<u>Total Cost Toronto (1+2)</u>	<u>U.S. ex Works Cost</u>	<u>Freight ex U.S. Factory to Destination</u>	<u>Total Cost ex U.S. Plant (4+5)</u>	<u>Advance of U.S. Plants (3-6)</u>	<u>% of Market Represented by Destination</u>
				-	\$ per 100 lb.	-		
St. John's, Nfld.	19.04	1.88	20.92	15.45	3.50	18.95	1.97	1.3
Moncton, N.B.	19.04	.99	20.03	15.45	1.75	17.20	2.83	5.8
Montreal, Que.	19.04	.39	19.43	15.45	1.45	16.90	2.53	26.7
Toronto, Ont.	19.04	.00	19.04	15.45	1.63	17.08	1.94	33.6
Ft. William, Ont.	19.04	1.55	20.59	15.45	2.52	17.97	2.62	.9
Winnipeg, Man.	19.04	2.15	21.19	15.45	1.74	17.19	4.00	5.2
Regina, Sask.	19.04	2.70	21.74	15.45	2.12	17.57	4.17	4.4
Calgary, Alta.	19.04	3.42	22.46	15.45	3.22	18.67	3.79	10.1
Vancouver, B.C.	19.04	3.17	22.21	15.45	1.57	17.02	5.19	12.0
								<u>100.0</u>

Source: Transcript, Vol. 142, p. 21148

The table was prepared assuming a Canadian ex-works cost of \$19.04 per hundred pounds at Toronto, Ontario and a U.S. ex-works cost as \$15.45 per hundred pounds, a cost advantage to the U.S. producer at works of \$3.59 per hundred pounds, or more than 23 per cent based on the U.S. price. Under these assumed figures (which are not actual) the companies concluded that, weighted by the size of market in different parts of Canada, the average cost advantage enjoyed by the American plants was equal to \$2.93 per 100 pounds net weight of product, after freight costs are considered. Over the Canadian market as a whole, therefore, the net effect of transportation costs was to reduce the U.S. advantage from that of the hypothetical cost-at-works of \$3.59 per hundred pounds. For centres west of Fort William, freight costs are shown as higher from Canadian plants, and Canadian producers would have to decide how much additional freight to absorb in that market area to be competitive.

Tariff Considerations

Classification of Goods

The products of this part of the study enter Canada, at present, principally under the following tariff items:

<u>Tariff Item</u>	<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
203a Chemical compounds composed of two or more acids or salts soluble in water, adapted for dyeing or tanning.	Free	Free
219a Non-alcoholic chemicals for disinfecting, or for preventing, destroying, repelling or mitigating fungi, weeds, insects, rodents, or other plant or animal pests, n.o.p.; non-alcoholic preparations compounded exclusively for disinfecting or for preventing, destroying, repelling or mitigating fungi, weeds, insects, rodents, or other plant or animal pests, n.o.p.:- (2) Otherwise	Free	Free
220a Chemical preparations, compounded of more than one substance, n.o.p. (i) When dry, or liquid containing not more than two and one-half per centum of proof spirit.....	15 p.c.	20 p.c.

<u>Tariff Item</u>		<u>British Preferential Tariff</u>	<u>Most- Favoured- Nation Tariff</u>
711	All goods not enumerated in this schedule as subject to any other rate of duty, and not otherwise declared free of duty, and not being goods the importation where- of is by law prohibited.....	15 p.c.	20 p.c.
791	Materials of all kinds for use in producing or manufacturing preparations provided for in tariff items 209b and 219a under such regulations as the Minister may prescribe.....	Free	Free
851	Materials for use in the manufacture of synthetic rubber.....	Free	Free

Soaps are provided for specifically under tariff item 228, mostly at rates of 15 p.c., B.P., 20 p.c., M.F.N. This item and, therefore, these products are not part of Reference 120, although some products classified to this item might conceivably be classified in heading 34.02 of the B.T.N.

The Industry Committee and the companies making the joint submission, namely, Canada Packers Limited, Colgate-Palmolive Limited, Lever Brothers Limited and the Procter & Gamble Co. of Canada Limited, requested that the products of the above items be classified according to Brussels heading 34.02, relevant portions of which are:

"(II) Surface-active preparations and washing preparations:
These preparations are mixtures and include:

"(A) Surface-active preparations consisting of:

"(1) Mixtures of the surface-active agents of paragraph (I) above (e.g., sulphoricinoleates mixed with sulphonated alkyl naphthalenes or sulphonated fatty alcohols).

"(2) Solutions or emulsions of the surface-active agents of paragraph (I) above in an organic solvent (e.g., a solution of a sulphonated fatty alcohol in cyclohexanol or in tetrahydronaphthalene).

"(3) Other mixtures with a basis of a surface-active agent of paragraph (I) above (e.g., surface-active preparations containing a proportion of soap).

"(4) Solutions or emulsions of soap in an organic solvent such as cyclohexanol. (Solutions of soap in water, usually with the addition of a small quantity of ethyl alcohol, are liquid soaps falling within heading 34.01).

"(B) Washing preparations consisting of:

"(1) Inorganic products such as sodium carbonate, sodium metasilicate, sodium hexametaphosphate, peroxy salts (e.g., sodium perborate), sodium tetraborate, etc., mixed together.

"(2) Mixtures with a basis of inorganic products (such as those referred to at (1) above), and containing also certain quantities of organic products (soaps, methyl-cellulose, pancreatic extracts, etc.).

"The preparations referred to above are covered by the heading whether used for household or industrial purposes. They are used for clotheswashing; for washing and scouring (de-greasing) textiles to facilitate, for example, dyeing (dyeing adjuvants) or bleaching processes; for washing and de-greasing metal articles (kitchen utensils, appliances of various kinds, etc.); for washing tiles; for cleaning tanks, etc. Organic surface-active agents and preparations are also used for the preparation of insecticidal or pharmaceutical emulsions, and for fire-extinguishing preparations.

"Sheets, booklets and similar articles of paper or cellulose wadding, impregnated or coated with organic surface-active agents, of a kind used for washing the hands, are also included in this heading. This heading does not cover:

(a) Shampoos (heading 33.06)

(b) Water-insoluble naphthenates and sulpho-naphthenates, as well as petroleum sulphonates not cited in paragraph (1) above. These products fall in heading 38.19, provided they are not preparations classified elsewhere."(1)

In addition to the adoption of the Brussels Nomenclature, the companies also suggested that there was no reason to distinguish between organic surface-active agents and non-organic surface-active agents for purposes of rates of duty and classification; they should all be considered as detergent preparations.(2)

Although several items are indicated above as applicable to the import of detergents and washing compounds, most of the relevant imports have been under items 220a(i) and 711 at rates of 15 p.c., B.P., and 20 p.c., M.F.N.; these are also the rates of duty for most soaps under item 228. Some entries apparently have been made under the end-use items noted above. The companies requested that the products not be permitted under the end-use items.

(1) Explanatory Notes, p. 330-1

(2) Transcript, Vol. 141, p. 21011

Rate Proposals and Arguments

In regard to the detergents and washing and cleaning preparations, the four producers requested the continuation of the rates of duty at 15 p.c., B.P. and 20 p.c., M.F.N., as at present applicable to most of these products.⁽¹⁾

In support of the proposed rates of duty the companies argued that the cost of production of these products in Canada was higher than in the U.S.A. To demonstrate the higher cost of production in Canada and the need for the requested duty protection, the four producers selected a sample of five retail household detergent packs, representing more than 60 per cent of their retail detergents business, as representative products. These products were as follows:

"Jim Dandy 24's -- a liquid general purpose hard surface cleaner
Lux Liquid 12's -- a dishwashing and light laundry liquid
Breeze 24's -- a heavy duty laundry powder containing a premium
Surf 24's -- a heavy duty laundry powder
'All' 8's -- a low-sudsing laundry powder designed particularly for use in automatic washers
('All' 12's in U.S.A.)"⁽²⁾

Based on the above sample, the companies concluded that the cost of production and distribution of detergent products in Canada is higher by 20 per cent or more than costs in the United States. This difference was said to be due to differences in costs of raw materials and packaging, the smaller scale of operation in Canada and to transportation and advertising expenses, analagous in some respects to the differences in the cost of producing surface-active agents, as noted in the first part of this section of the report.

For raw materials, as previously noted, the companies stated that Canadian raw material costs per unit of product range from 20 per cent to 35 per cent higher than the costs of raw materials for similar products in the United States and that packaging materials ranged from 8 per cent to 45 per cent higher in Canada than in the United States.

The detergent producing plants are said to be smaller in Canada than those in the U.S.A., contributing to the higher cost of production in Canada.

"The effect of small volume on production costs pervade all aspects of manufacturing. In general, the small production runs result in relatively inefficient use of the labour force, and less intensive use of manufacturing equipment. Samples of these costs range from 13% to 40% higher for Canadian products than for counterparts in the United States.

"The test sample we have used indicates that our administration costs (including sales and general administration) per unit of product exceed those of our United States associates by approximately 30%."⁽³⁾

(1) Transcript, Vol. 141, p. 21000

(2) Same, Vol. 142, p. 21144

(3) Same, Vol. 142, p. 21139, 21150

With regard to transportation costs, it was stated in the composite brief:

"It is difficult to generalize about transportation and warehousing costs, but the considerations which currently make it mandatory for a modern detergent plant to be located in Central Canada, also make it necessary to use more transportation and warehousing in Canada than is required in the United States, where plants are on the average much closer to their main markets. The transportation and warehousing element in the sample calculations suggests that, comparing costs of transporting product to the Canadian market as a whole, physical distribution costs to the Canadian industry would be 15% higher than to the United States industry.

"At all points west of Fort William, the United States has an actual freight rate advantage which would average at least 25% of the Canadian freight rates to that area."⁽¹⁾

As noted previously, the companies also referred to higher advertising costs in Canada resulting from the use of two languages and the smaller market.

For industrial detergents, the joint submission stated:

"Up to this point, no mention has been made of industrial detergent preparations. However, the cost analysis suggested to the Board in confidence must represent a similar case for the industrial packs. There are industrial products sold with similar formulas and similar costs. Transportation costs would be identical, and packaging costs while presumably less expensive would bear the same relationship to retail packaging costs in both countries. It would appear that the same level of duty rates is required."⁽²⁾

Noting the devaluation of the Canadian dollar, the spokesman for the companies stated:

"At the present time with a currency recently devaluated and with current government policies aimed at restricting imports, argument for 20% protection may seem uncalled for until the temporary nature of such conditions is understood. We must recognize however, that it would take only slight changes in world investments or trade conditions to alter the present circumstances."⁽³⁾

Imports from British preferential countries have not been a significant factor in the Canadian market. In justification of the 15 p.c. British preferential rate, the spokesman for the companies said:

(1) Transcript, Vol. 142, p. 21139-40, 21146

(2) Same, Vol. 142, p. 21157

(3) Same, Vol. 142, p. 21155

"It is just a relationship to the 20 20 p.c., M.F.N.7.
The 20 is the one we are basing our argument on. This is
the standard relationship more or less."(1)

The rates of duties asked by the companies are, in substantial effect, the present tariff duties on imports of most detergent products. As has been noted, the companies requested that duty-free entry or lower rates of duty, as provided for under end-use items, not apply to the relevant detergents and washing preparations.

These arguments are essentially the same as those noted above for the surface-active agents. The Board has not been able to investigate thoroughly the cost comparisons presented by the companies, nor any possible offsets to these which might be present. With respect to supplying a very substantial part of the Canadian market, the advantage of location of the Canadian firms, which was noted in the first part of the report on this heading also applies here. The Canadian market is continually growing and, apparently, the Canadian producers are continually trying to introduce new, more efficient equipment, methods of operation, products and packaging to maintain or enhance their competitive position in the Canadian market.

Dye and Chemical Co. of Canada Ltd., in a submission on dry-cleaning surface-active preparations and spotters, requested that these preparations be treated as a group and the present rates of duty of 15 p.c., B.P. and 20 p.c., M.F.N., be retained without the necessity of a "Made-in-Canada" provision. They are at present imported under tariff item 220a(i), bearing duty rates of 15 p.c., B.P. and 20 p.c., M.F.N.

No special arguments were made in support of the above request.

Canadian Industries Limited, making a submission on blended alkalis, proposed that rates of 15 p.c., B.P. and 20 p.c., M.F.N., continue to apply to blended alkali mixtures. The existing rates of duty are 15 p.c., B.P. and 20 p.c., M.F.N. under tariff item 220a(i), and for the principal ingredient, anhydrous caustic soda, 1/5¢ a lb., B.P., and 3/10¢ a lb., M.F.N. under tariff item 210a. For caustic soda, rates of 15 p.c., B.P. and 20 p.c., M.F.N., had been proposed under B.T.N. heading 28.16. No substantially new or different information was presented in support of these rates of duty for blended alkalis.

(1) Transcript, Vol. 142, p. 21267

PREPARED EXPLOSIVES, INCLUDING PROPELLENT POWDERS -
B.T.N. 36.01 and 36.02

The Products and Process of Manufacture

This part of the report deals with commercial explosives, including propellant powders and other prepared explosives. Not included are finished ammunition products such as shotgun shells and cartridges. Also, explosives for other than the commercial use, such as munitions of war, do not fall within the scope of this inquiry; nor do signals, fusees, fireworks, etc., though some of the chemicals used in their manufacture are discussed in other sections of the report. Although value information is not generally available, it is estimated that the market in Canada for the products under review in this section is in the order of \$36 million.

An explosive may be defined as a chemical or chemical mixture which can, in response to appropriate initiation, undergo rapid exothermic, self-propagating decomposition. For explosives other than propellant powders, this decomposition is almost instantaneous, while for propellents it is slower and more controlled. The non-propellant explosives are used for breaking rocks or moving ground, whereas propellant powders are used for the controlled propulsion of a projectile.

Propellents are of two principal types - black powders and smokeless powders. Black powders, as defined in the Explanatory Notes to the Brussels Tariff Nomenclature, are intimate mixtures of potassium nitrate, which supports combustion, and two combustible products, sulphur and charcoal. These products are black or brown in colour, more or less hygroscopic, and used as sporting-powder; some forms of black powder also are used in prepared blasting agents. In the first case, the powder is in the form of round regular sized grains; in the second, it usually consists of broken grains of various sizes.

The definition of smokeless powders, at page 340 of The Explanatory Notes to the Brussels Nomenclature, is:

"Smokeless powders [are] based on nitrocellulose (usually guncotton) mixed with other products, particularly stabilizers (e.g. diphenylamine). These powders are usually manufactured from nitrocellulose and solvents with or without the addition of potassium nitrate, barium nitrate, alkali dichromates, etc., or by the association of nitroglycerol with nitrocellulose (ballistites, cordites, etc.). Smokeless powders are usually in the form of cord, sticks, discs, tubes, flakes or grains..."

The other prepared explosives are of various types. There are explosive mixtures based on nitric esters of polyhydric alcohols, for example, explosives with a base of ethanediol dinitrate (dinitroglycerol), of pentaerythritol tetranitrate (penthrite), of glycerol trinitrate (nitroglycerin or nitroglycerol) or of mannitol hexanitrate. The most important of this group are the dynamites which are mixtures of nitroglycerin with an inert absorbent substance, with one or other

product which can contribute to the explosive power. These are referred to throughout this report as nitroglycerin-type explosives or as dynamite.

Other important explosive mixtures are based on (1) nitrated derivatives, such as trinitrotoluene (TNT), (2) ammonium nitrate, such as westphalites, ammonals and ammonium nitrate-fuel oil mixtures, (3) chlorates or perchlorates, e.g., cheddites, (4) initiatory explosives, mainly based on mercury fulminate, lead azide, lead styphnate, etc. The last group is used principally in percussion caps and detonators; these end products are not part of this study. The other two groups embrace types of explosives frequently used as blasting agents of a lower power than the nitroglycerin type explosives and are referred to as blasting explosives.

The principal products of this section of the report can be grouped as follows:

- (A) Propellant Powders
 - Black powder (also used in other explosives)
 - Smokeless powders
- (B) Prepared Explosives other than Propellents
 - (i) Nitroglycerin dynamites
 - (ii) Ammonium Nitrate - Fuel Oil Mixtures (AN/FO)
 - (iii) Blasting Slurries

In trade, AN/FO and slurry explosives are commonly known as blasting explosives or blasting agents and they are referred to as such in this report.

The separate chemicals which are used in prepared explosives, for example, trinitrotoluene, nitrocotton, ethylene glycol and glycerine are presented in detail elsewhere in the report under the appropriate product class.

Dynamites and blasting explosives are produced in Canada in various forms and types.⁽¹⁾ Also manufactured in Canada, from imported smokeless powders, are propellents for shotgun shells and for rim fire and centre fire rifles. Of the main types of the smokeless powders used in Canada, one is based on nitrocellulose and the other on nitrocellulose and glycerine. The former is used in centre fire ammunition, the latter in shotgun shells and rim fire manufactures. Propellents are made in a variety of grades of which Canadian Industries Limited, the largest manufacturer of commercial ammunition, reported that it uses 34 in varying amounts.

Materials for the manufacture of the explosives which are produced in Canada include ammonia and ammonium nitrate, ethylene glycol, glycerine, starch and wheat, sulphur, pulps, toluene and trinitrotoluene, aluminum, nitric acid and sulphuric acid. The imported materials include sodium nitrate, guar, cotton linters, platinum, smokeless powders and some trinitrotoluene.

(1) Canadian Industries Limited, Blasters' Handbook, Fifth Edition, Montreal, 1964

Black powder was the first commercial explosive produced and it has been known for at least 700 years. In Canada, it was made as early as 1855. Its use has been declining because of replacement by smokeless powders.

"Nitroglycerine, a very sensitive and exceedingly powerful explosive, was utilized as a commercial explosive shortly after its discovery in 1847. It was, however, very hazardous to handle and did not find widespread use until Alfred Nobel found various means of improving its safety and reliability in the 1860's. After these discoveries, nitroglycerine explosives rapidly displaced black powder, and, for almost a hundred years, have dominated the commercial explosives field in all countries of the world. Many improvements were made in formulations, in production methods, and in blasting techniques. Because of the efficiency of these explosives and the relatively low and stable cost, it seemed until quite recently unlikely that nitroglycerine type explosives would yield their dominant position in the commercial market.

"During the past decade there has been a rapid increase in the development and use of non-nitroglycerine explosives, usually termed 'blasting agents'. These are much less sensitive products, and usually require a primer, i.e. an amount of a sensitive explosive, to ensure their initiation. Blasting agents, being less sensitive to shock, friction and impact, are naturally safer in use than nitroglycerine explosives. The most important of these blasting agents is a mixture of ammonium nitrate and fuel oil, the cost of which is a third or even less than that of nitroglycerine based explosives. Several other blasting agents (in particular, a slurry explosive containing trinitrotoluene, ammonium nitrate, sodium nitrate and water as principal ingredients) are also finding increasing application. It has become evident only in the past few years that these explosives will definitely preempt the position held for so long by nitroglycerine explosives."⁽¹⁾

The ammonium nitrate and fuel oil (AN/FO) development, initiated in 1956, was first considered useful only for large drill holes in open pit work, but now it has proven practicable in small-diameter holes, and with the resolution of other problems its use is spreading to underground mining operations. The slurry type explosives referred to above are still under development. The most recent, developed in 1961, are metallized slurries which contain sensitized powdered metal such as aluminum; the added metal is said to increase the available energy.

Blasting explosives soon began to reduce the share of the market held by nitroglycerin explosives. Because these newer explosives are simpler and cheaper to produce, their use is increasing and it is expected that the AN/FO and slurry type explosives will take 70 to 75 per cent of the explosives market before very long.⁽²⁾

(1) Transcript, Vol. 106, p. 16007, 16008

(2) Same, Vol. 106, p. 16014

The history of the explosives industry in Canada is mostly associated with Canadian Industries Limited or its predecessor companies, Canadian Explosives Limited and Hamilton Powder Company. The Hamilton Powder Company was manufacturing commercial explosives in Canada in 1862. After a few years of operation, it was acquired by Nobel Explosives Company, Ltd. of England. In 1910, Nobel Explosives Company along with Du Pont Company formed Canadian Explosives, Ltd., and acquired four or five other Canadian explosives companies. In 1927, Canadian Explosives, Ltd. widened its scope of operations by processing industrial chemicals and changed its name to Canadian Industries Limited.⁽¹⁾ C.I.L. and its predecessors had been the largest manufacturers of explosives in Canada and had produced gun-cotton, cordite and trinitrotoluene and other ammunition even before World War I. Their scale of operations had quite naturally been much wider and larger during the two World Wars than in peace time. Some of the products, for example smokeless powder produced during the wars, have been discontinued in peace time owing to reduced markets.⁽²⁾

The manufacture, testing, sale, storage and importation of explosives in Canada are governed by the Explosives Act of 1946, its amendments and regulations.

The manufacture of explosives is essentially a mixing or blending of specially prepared ingredients which are likely to receive further processing during this stage of the manufacturing operation. The production of the individual raw materials is described in other sections of the report.

Black powder (gun powder) is produced by mixing potassium nitrate, sulphur and charcoal. A typical formula is 70-75% potassium nitrate, 10-14% sulphur, and 14-16% charcoal. These ingredients are reduced to powder separately in ball mills grounded to prevent ignition by electric sparks. The powders are then transferred to wheel mills for mixing and the addition of a small amount of water. These mills are generally equipped with remote controls and no person is allowed in the building when the machinery is in operation. The ground material is pressed into cakes which are subsequently broken and ground; then the granular product is rolled in drums with graphite so that the grains are coated to eliminate friction.⁽³⁾ Black powders are used as propellents as well as for other explosives. It was stated at the public hearing that in Canada 90 per cent of the use is at present as an explosive for blasting purposes.

Smokeless powder is based on nitrocellulose and solvents, with or without the addition of potassium nitrate, alkali dichromates,

-
- (1) C.I.L. and Du Pont of Canada Limited became separate corporations on July 1, 1954
- (2) H. Marshall, F.A. Southard, Jr., K.W. Taylor; Canadian-American Industry; Yale University Press, New Haven, Conn.; 1936, p. 83, and C.J.S. Warrington and R.V.V. Nicholls; A History of Chemistry in Canada; Sir Isaac Pitman and Sons (Canada) Limited, Toronto; 1949, p. 307, 308
- (3) W.T. Read, Industrial Chemistry; John Wiley and Sons, Inc., New York, Third Edition (1950), p. 582

etc., or it is made by the association of nitroglycerin with nitrocellulose (ballistites, cordites, etc.). "The term ballistite usually refers to a nitroglycerin - nitrocellulose powder formed into sheets on rolls and subsequently cut to the desired dimensions."⁽¹⁾ Powders for small arms are lightly coated with graphite to reduce danger of ignition by static electricity generated by the rubbing of the grains.

The nitroglycerin-type explosives are manufactured from glycerol, ethylene glycol, trinitrate and trinitroglycerin. They are typically a pale yellow, thick, flammable, explosive liquid, soluble in alcohol and ether, slightly soluble in water; freezing point 13.1°C. and explosion point 260°C. They are derived from dropping glycerol or ethylene glycol through cooled, mixed acid, and stirring followed by repeated washing with water. They are contained in tin cans and used in the production of dynamite and other blasting agents. The explosive grade glycerol and ethylene glycol are specially prepared for this use.

The blasting explosives, said to be less sensitive products, generally require a detonator, primer and a powerful booster to initiate the blast. These explosives, being less sensitive to shock, friction and impact, are considered to be safer in use than nitroglycerin explosives. AN/FO, commercially the most important of these newer type explosives, is a mechanical mixture consisting roughly of 94 per cent ammonium nitrate and 6 per cent fuel oil. The process of manufacture of this type of explosive is simple, requiring neither elaborate equipment nor special skill. It involves simply mixing ammonium nitrate with a carbonaceous material such as fuel oil, coal dust, etc. The ammonium nitrate used by C.I.L. in the manufacture of AN/FO is claimed to be a special kind, coated and prilled to give it more desirable properties. Until recently the technique of producing an efficient ammonium nitrate-fuel oil mixture was not fully developed and there were some technical problems, for example, whether oil, coal dust, or some other carbonaceous material should be mixed with ammonium nitrate to produce the desired properties.

Blasting slurries, as noted above, are also of recent development and are still undergoing change. They generally consist of a mixture of ammonium nitrate, TNT and water, together with minor amounts of other ingredients. The mixture is often of the consistency of thick soup. A primer is used to initiate the explosion. To newer type slurries, a metal, such as sensitized aluminum, is added. These metalized slurries consist of a mixture of 5 to 25 per cent of metal (aluminum, magnesium or ferrosilicon); 5 to 15 per cent of an organic high explosive such as nitroglycerin or TNT; 0.5 to 1.5 per cent of a gelling agent, with the balance being ammonium nitrate.⁽²⁾ The so-called "canned slurries" based on ammonium nitrate, water and TNT are no longer popular and their place is taken by the newer type slurries.

The explosives industry is still experimenting with different types of slurries in order to make them more powerful and safer, but the ratios of basic ingredients vary more often than do the ingredients themselves. Efforts are being made to use less explosives, such as nitroglycerin, TNT and PETN (pentaerythritol tetranitrate) in the prepa-

(1) W.T. Read, quoted work, p. 438

(2) Chemistry in Canada, September, 1964, p. 18

ration of slurries, so as to make them less hazardous to handle. These explosives are replaced by other products, such as metal, which maintain sufficient power in the explosive while retaining the resistance to water.

Blasting slurries have properties which cannot be duplicated with the less expensive ammonium nitrate-fuel oil mixtures, particularly the resistance to water. Slurries based on TNT hold a considerable share of the market. Du Pont was reported to use imported TNT in the manufacture of its slurries; C.I.L. produces TNT by a multi-stage nitration of toluene with a mixture of nitric and sulphuric acids. The new plant recently completed by the company at Beloeil, Quebec, uses a novel continuous process which is said to be particularly efficient and safe, and was represented as the first commercial application of this process in the world.

The AN/FO and slurry explosives may be factory mixed or mixed at the blasting site. The slurries may be packaged or pumped by a unique operation directly into the blasting holes.

Strontium nitrate, another explosive material, is used by Canadian Industries Limited only in the manufacture of fusees which are used extensively by the railroads and, to a lesser degree, by truckers and others as signals or warning devices. Strontium nitrate is discussed in the section of the report dealing with B.T.N. heading 28.39; the final products are not part of Reference 120.

The Industry

Companies, Plants, Location

Smokeless powders are not made in Canada; at least four companies, in addition to C.I.L., use imported propellant powders for the manufacture of ammunition. These other companies are: Gevelot of Canada Limited, Saskatoon, Sask.; Remington Arms of Canada Limited, Long Branch, Ont.; Winchester-Western (Canada) Limited, Cobourg, Ont.; XL Explosives Limited, Hawkesbury, Ont.

At the time of the hearing, in November 1962, there were three companies engaged in the production of commercial explosives. These do not include Canadian Arsenals Limited, various mining companies which mix their own explosives, nor companies which make products that are not part of this study. Altogether more than 100 variations, grades and trade names of explosives and ammunitions are listed as produced in Canada.⁽¹⁾ The three companies, Canadian Industries Limited, Du Pont of Canada Limited, and Delta Explosives Limited, operate nine plants which produce explosives that are in this Reference. Explosives are sold on an f.o.b basis and because of the hazards involved in long distance transportation, the explosives industry is well distributed geographically. The tendency has been to decentralize and to locate plants nearer to the centres of consumption. Quebec and

(1) Department of Mines and Technical Surveys, Annual Report 1963, Explosives Division

Ontario each have three plants; Manitoba, Alberta and British Columbia, one plant each. There are no explosives manufacturing plants in any of the four Atlantic Provinces. The most westerly plant producing explosives is located at James Island, British Columbia, and the most easterly plant is at Sept Iles, Quebec. In view of the advantages of geographical dispersion, the plants producing explosives tend to be smaller in size than if they were centralized, though some of the plants producing explosives also manufacture a variety of other chemicals for other purposes.

Location of Plants and Type of Explosives Produced

<u>Name of Firm</u>	<u>Year of Establishment</u>	<u>Province</u>	<u>Location of Plant</u>	<u>Type of Commercial Explosives Produced</u> ^(a)
Canadian Industries Ltd.	1878 ^(b)	Quebec	Beloeil	Nitroglycerin dyna- mites, slurries, TNT, DNT, nitrocotton, and AN/FO
	1957	"	Sept Iles	Slurries and AN/FO
	1913	Ontario	Nobel	Nitroglycerin dyna- mites and slurries
	1962	"	Sudbury	AN/FO and slurries
	1934	Manitoba	Brainerd	Nitroglycerin dyna- mites (obtain gelatin dough from Calgary), slurry and AN/FO
	1950	Alberta	Calgary (Ogden)	Nitroglycerin dyna- mites (use imported glycerine) and slurries
	1913	British Columbia	James Island	Nitroglycerin dyna- mites (obtain gelatin dough from Calgary)
Du Pont of Canada Ltd.	1957	Ontario	North Bay	(1) Nitroglycerin dynamites (2) TNT and aluminum slurries (3) AN/FO
Delta Explosives Ltd.	1961	Quebec	Oka (St. Joseph du Lac)	AN/FO and slurries

^(a) Peace time production

^(b) The portion of the plant producing TNT was burned down in 1958 and was rebuilt in 1962

Source: Transcript, Vols. 106 and 107, various pages

Most of the C.I.L. plants, with the exception of its newer plants at Sept Iles and Sudbury, produce both nitroglycerin type explosives and blasting agents. The two newer plants, however, are designed to specialize in the production of slurries and AN/FO mixtures. The C.I.L. plant at James Island has undergone considerable reduction of output in recent years. It has stopped production of nitroglycerin and now manufactures nitroglycerin explosives from a form of nitroglycerin, called gelatin dough, brought in from the Calgary plant. This is reformulated and packaged into commercial explosives. The Du Pont plant at North Bay, Ontario, manufactures all three types of explosives - nitroglycerin, TNT and aluminum slurries and AN/FO explosives; the Delta Explosives plant at Oka (St. Joseph du Lac), Quebec, produces only the ammonium nitrate-fuel oil mixtures.

A list of all the factories licensed in 1963 to manufacture explosives and similar products, not all of which are covered by this Reference, is given in Appendix III.

Information on the installed capacity in the explosives industry is not readily available. It was stated in the hearing by the C.I.L. representative:

"The capacity, at the present time for the two new and expanding types of explosives -- AN/FO and slurry, is certainly adequate to supply all present, and indeed, foreseeable future requirements, but it is not necessarily the most efficient capacity...There have been two new plants put up by C.I.L. within the past two years which are specifically designed to produce slurry-type blasting agents and ammonium fuel oil types. One is at Sudbury and the other is at Sept Iles, Quebec. It is possible that further plants of this type may be constructed in the future."⁽¹⁾

In regard to the nitroglycerin type explosives, for which the market is declining, the C.I.L. representative said:

"We estimate that if all Canadian explosive plants were to produce nitroglycerin at 100% of their capacity this amount would represent approximately three times the amount of nitroglycerin explosives which are currently required by domestic consumers. Adjustments are being made which bring capacity more closely in line with our requirements. As you appreciate, this does take time, and in addition it is, to some extent, to the advantage of the manufacturer to have capacity available rather than shut down his entire facilities even though the capacity which he has available is very much more than is required to serve the market. To shut down a nitroglycerin operation, for example, is a major step and completely eliminates production of nitroglycerin from that particular plant location. There is no way you can chop away at your capacity in order to reduce capacity precisely to meet requirements."⁽²⁾

⁽¹⁾ Transcript, Vol. 106, p. 16044

⁽²⁾ Same, Vol. 106, p. 16042, 16043

In brief it can be said that a sufficient manufacturing capacity exists in Canada to meet the demand for the newer types of explosives, i.e., AN/FO and slurries, and because of declining demand for nitroglycerin type explosives over-capacity exists for these types.

The plants producing nitroglycerin explosives may be used to some extent to produce ammonium nitrate-fuel oil type explosives, but cannot produce these or slurry type explosives as efficiently as a plant built specifically for these newer types of explosives.

The Canadian Market

The present Canadian market for commercial explosives appears to be in the neighbourhood of 250 million pounds a year, having grown by more than 90 per cent since 1955 when it was 131 million pounds. The commercial value of these explosives is in the order of \$36 million, depending upon the actual variety of explosives in use at a particular time. Because of the substitution of the cheaper blasting explosives for dynamite through these years, the value of explosives has not increased appreciably. Sixty per cent or more of the explosives are used in mining and quarrying; most of the balance is used in heavy construction, such as hydro-electric power, roads and rails. Some blasting materials are also used in seismic operations, logging and farming. Because of the mining and exploring activity in central and eastern Canada, 75 per cent of the explosives market is said to be in Ontario and Quebec.

The production of commercial explosives in licensed factories, as given in the annual reports of the Explosives Division of the Department of Mines and Technical Surveys, is as follows:

Production of Commercial Explosives in Licensed Factories, 1955-64

<u>Year</u>	<u>Pounds</u> '000	<u>Dollars</u> ^(a) '000
1955	130,643	..
1956	148,080	..
1957	169,492	..
1958	155,750	29,900
1959	158,000	30,600
1960	161,000	30,200
1961	147,000	25,800
1962	180,000	26,600
1963	201,000	28,200
1964	252,000	36,000

(a) Estimated by the Tariff Board on the basis of average selling prices; the estimated commercial values, therefore, should be interpreted only as a general order of magnitude and not as value of shipments

The proportion of the market served by the imported explosives, other than smokeless propellant powder, is very small, being less than one per cent in recent years. Iron ore mining ventures in which there are substantial U.S. ownership interests tend to use some explosives made in the U.S.A.; importation of these explosives is subject to sharp fluctuations. Certain other uses call for special types of explosives which are imported.

As noted above, not only is the Canadian market growing, but its structure is also rapidly changing, with the nitroglycerin type of explosive giving place to ammonium nitrate - fuel oil mixtures and to slurry type blasting agents. In 1958, the nitroglycerin-type served 90 per cent of the market; the ammonium nitrate - fuel oil mixtures made up the remainder, and the slurries were just beginning to penetrate the market. By 1964, the proportions were in the order of 38 per cent, 34 per cent and 28 per cent respectively, and it is expected that this trend towards increased use of AN/FO and slurries will continue for some time, although advantages of the nitroglycerin type in some applications should tend to stabilize its use, possibly at around 25 or 30 per cent of total market requirements. The following figures show the changing structure of the explosives market in Canada from 1958 to 1964.

Production of Explosives, by Type, in Canada,
1958-64

<u>Year</u>	<u>Nitro-glycerin explosives</u> '000 lb.	<u>Per cent of total production</u> %	<u>AN/FO Mixtures</u> '000 lb.	<u>Per cent of total production</u> %	<u>Slurries</u> '000 lb.	<u>Per cent of total production</u> %
1958	140,000	90	12,500	8	2,500	2
1959	142,000	90	8,500	5	7,500	5
1960	129,000	80	18,500	11	13,800	9
1961	113,000	77	23,000	16	11,000	7
1962	92,000	51	59,400	33	29,000	16
1963	87,000	43	74,000	37	40,000	20
1964	96,000	38	85,000	34	71,000	28

Source: Breakdown by types estimated from data supplied by the Department of Mines and Technical Surveys, Explosives Division

In spite of the substantial increase in the quantity of explosives being used, changes in the structure of the market during the past decade or so have resulted in little appreciable increase in the commercial value of the explosives because the higher priced explosives have been giving way to the lower priced.

As noted in the following section, imports of explosives are not of great importance in the supply of Canadian requirements, nor are exports as a market for Canadian production.

For the blasting agents, the market for the canned type slurries is decreasing, while the market for pelletized TNT and aluminum slurries is increasing.

Imports of Propellant Powders,^(a)
by Country of Origin, 1959-63

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
<u>Total Imports, All Countries</u>					
Quantity (lb.)	573,152	391,300	432,151	424,667	506,056
Value (\$)	393,978	394,962	461,810	448,052	547,547
<u>U.K.</u>					
Quantity (lb.)	77,824	34,320	40,825	38,000	89,000
Value (\$)	28,514	12,577	20,413	24,552	49,271
<u>U.S.A.</u>					
Quantity (lb.)	495,328	349,584	370,058	371,199	415,373
Value (\$)	365,464	362,333	410,276	401,791	495,834
<u>France</u>					
Quantity (lb.)	-	7,396	19,840	11,904	-
Value (\$)	-	20,052	29,324	17,132	-
<u>Other</u>					
Quantity (lb.)	-	-	1,433	3,564	1,683
Value (\$)	-	-	1,797	4,577	2,442

(a) Thought to be almost all smokeless powder, but includes some black powder, mostly imported from the United Kingdom

Source: D.B.S., Trade of Canada, Imports, s.c. 8137; gun, rifle, sporting, cannon musket and cannister powder

As propellant powders are not made in Canada, their consumption is reflected in import data; these show little change in the quantity used since 1957. Imports are generally about 500,000 pounds, valued at about \$500,000, almost entirely from the U.S.A. Although most of the importation of propellant powders undoubtedly is by C.I.L., as the largest producer of sporting ammunition, there are four other companies licensed to produce ammunition. C.I.L. indicated that there had been production of smokeless propellant powders during World War II, but that production of such powders would not be economically feasible in Canada on a normal commercial basis until there was a market for about one million pounds. The growth in the market has not been rapid and, at the time of the hearing, the company did not expect it to

reach the required size for many years. Economic production, moreover is further complicated by the variety of performance requirements and powder content of the formulations; the company noted that the annual consumption of one specific grade and type of powder may be as little as 30 pounds.

The market in Canada for black powder as a propellant is no longer very significant. The powder for propellant use is not made in Canada and available information suggests that during the past three years imports, principally from the U.K., have been well under 100,000 pounds a year.

The spokesman for C.I.L., indicated that black powder was used as a blasting agent as well as a propellant and that the company produced it for this use only. The company's production accounted for 90 per cent of the total black powder used in Canada, the remainder being imported for the manufacture of propellents. In total, the spokesman indicated that black powder in 1962 represented less than half of one per cent of the total explosive usage in Canada. It would appear then, that Canadian consumption of black powder would be well under one million pounds a year. Similarly, the value of the black powder for propellant and blasting uses together would appear to be under \$500,000 a year.

Foreign Trade

This section of the report deals only with those prepared explosives which are within the scope of the Reference; consequently, large amounts of explosives which are imported in other forms are not dealt with here. These other forms include materials, such as tri-nitrotoluene, nitrocotton and other nitro compounds which are dealt with as single chemicals in other parts of the report. Finished articles such as safety and detonating fuses, primers, safety cartridges and manufactured fireworks are not included in this Reference. For comparative purposes, a table based on tabulations by the Explosives Division of the Department of Mines, is given in Appendix I; it shows imports under general headings, including these other products. A summary of imports of products relevant to this study is given in the accompanying table.

As noted in the previous section, imports of propellant powders consist principally of smokeless powders, black powder forming a relatively small part of the total. It was also noted that imports of propellant powders have been relatively stable over the past few years, although some decline in volume is apparent when the years 1961-63 are compared with 1957-59. Abnormally high imports were recorded in the years 1952-55, as the appendix table indicates. The value of the imports of propellant powders is usually in the order of \$500,000 a year and it is noteworthy that the lower volume of imports has not been accompanied by a parallel decline in their value, especially in recent years.

Imports of the group referred to as "blasting and mining powder" have not been very significant in recent years and, in 1963, imports of these powders all but ceased.

Imports of Propellant Powders and Prepared Explosives
into Canada, 1957-63

<u>Products</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
Gun, rifle, sporting, cannon, musket and cannister powder s.c. 8137	lb. \$ \$/lb. 539,518 403,168 .75 563,655 536,274 .95 391,300 394,962 1.00 432,151 461,810 1.06 506,056 547,547 1.08						
Blasting and (a) mining powder s.c. 8133	lb. \$ \$/lb. 20,750 3,311 .16 1,000 562 .56 132,000 17,580 .13 51,000 8,280 .16 500 169 .34						
Dynamite and nitroglycerin s.c. 8134	lb. \$ \$/lb. 1,297,800 285,171 .22 1,358,100 257,894 .19 13,550 5,495 .41 11,700 7,568 .65 46,420 14,147 .30						
Explosives n.o.p. s.c. 8138	lb. \$ \$/lb. 489,038 363,511 .74 3,584,724 875,242 .24 3,702,008 853,741 .23 461,833 181,704 .39 1,979,090 536,416 .27						

(a) This powder is thought to be principally black powder, some of which is used as a propellant in ammunition

Source: Dominion Bureau of Statistics

The data shown in the table for dynamite and nitroglycerin explosives in 1957 and 1958 reflect the abnormally high imports which were partly due to the construction of the St. Lawrence Seaway; since then, imports of this type of explosives have been very small relative to the size of the Canadian market for explosives of all kinds.

Little is known about the imports under the heading "explosives, n.o.p." which had a value in 1962 and 1963 of about \$500,000, somewhat higher than was typical in the preceding years. Their relatively low average value suggests that they include some blasting agents and probably some single chemicals which are dealt with elsewhere in the report.

In regard to the imports of different types of explosives, the C.I.L. representative stated:

"Certainly at present the low-cost mixtures, namely the scrap ammonium nitrate-fuel-oil mixtures, are selling in the neighbourhood of \$5 per one hundred pounds f.o.b. plants, and at the present time these mixtures are certainly not coming in in any significant volume.

"Blasting agents or non-nitroglycerin type explosives which are entering, tend to be those with somewhat higher value, in the ten to fifteen dollars area. For example, the type in cans have been brought into Canada for particular uses, and especially for use under extremely wet conditions." (1)

Imports of prepared explosives other than propellant powders, as compared to domestic production and consumption, have been small. In 1957, imports of such explosives amounted to 1,807,588 pounds compared with Canadian production of explosives of 169,500,000 pounds. In 1961, imports dropped to 524,533 pounds and total production to approximately 147,000,000 pounds; in 1963, imports increased to 2,026,010 pounds compared with production of 200,000,000 pounds. The wide fluctuation in imports was said to be partly associated with developments in iron ore mining and in exploration activity in other metal mines. The iron ore mining activity has tended to result in substantial imports of explosives during the initial stages of development but the use of explosives diminishes as a property becomes developed. Even though imports of explosives have shown considerable fluctuation, their share of Canadian consumption has remained small, reflecting the competition offered by the Canadian producers in price, quality and service, as well as the transportation costs and hazards of longer distances which are involved and the rapidly changing structure of the market for explosives.

The main sources of imports have been the U.S.A. and Britain, although some smokeless powders have been imported from other countries, particularly France, in recent years. The United States typically supplies 80 to 90 per cent of Canada's imports of explosives.

(1) Transcript, Vol. 107, p. 16133, 16134

Data on exports of explosives from Canada are not available in published form. Information available to the Board suggests that, although exports fluctuate greatly from year to year, there are many years when Canada has a net export balance of trade in explosives. The spokesman for C.I.L. indicated that it was difficult to achieve any significant export market in countries which had a developed explosives industry designed to cater to the particular, special requirements of that market. The establishment of a distribution system and maintenance of technical sales and service facilities add to the difficulties of serving a market in competition with the domestic industry. He indicated that the company's exports of explosives were principally to countries in the Caribbean and South America which have no manufacturing facilities of their own and where the company was able to compete with other foreign suppliers.

"...the countries we export to, I would say the keenest competition is from the U.S. manufacturers. I am speaking of the Caribbean area, Central America. We also have, from time to time, shipped into the Pacific area, the Philippines. There we have faced competition not only from the U.S. manufacturers but from Japanese manufacturers. I would say the majority of our export shipments have gone to the Caribbean area and certain parts of South America. We have faced competition from U.S. manufacturers and also European manufacturers."(1)

Prices and Pricing Policy

Explosives in Canada are sold f.o.b. works or f.o.b. storage magazine. Prices at magazines include freight and handling expenses from works to magazines.

Selling prices of nitroglycerin explosives, f.o.b. western plants -- Brainerd, Manitoba, Calgary, Alberta and James Island, British Columbia -- are higher by \$1.65 per hundred pounds than at Beloeil, Quebec and Nobel, Ontario. This was said to result from the higher cost of raw materials to western Canadian plants, owing to transportation costs and the relatively smaller scale of plants and higher wages, especially in British Columbia, than in some plants in central Canada.

A different method of pricing is used in the United States where explosives are sold on a delivered basis. There are two zones, but probably 95 per cent of all explosives are sold in the lower-priced Zone 1; the balance is sold in Zone 2, the peripheral areas, at a premium of 75 cents per hundred pounds.

Prices of Canadian explosives have traditionally been low enough to be competitive with United States supplies even at locations close to the border; Canadian consumers were said to enjoy, on the average, lower delivered prices than they would for explosives imported from the United States. The spokesman for C.I.L. noted that

(1) Transcript, Vol. 106, p. 16064

"Over the years, ...Canadian prices for explosives have been consistently lower than the delivered cost of U.S. counterparts; and, in fact, this tendency has been accentuated by the recent swing in exchange rate."(1)

Further he noted that the company's prices were not just "set" to meet foreign competition but that

"meeting the competition is only one of the many circumstances that go into our pricing. It so happens over the years our explosives have been competitive at most, if not all, border points with imported supplies."(2)

With respect to propellents, black powder from the United Kingdom was said to be priced from 29 cents to 50 cents per pound. This price was sufficiently low to encourage importations from that country to meet at least some of the small requirements for this type of powder in Canada. Smokeless propellant powders are imported from the United States at a price of one dollar, or more, per pound.

Prices of Certain Popular Explosives,
per 100 pounds, 1964

<u>Type of Explosive</u>	<u>Trade Name</u>		<u>Strength or Diameter</u>	<u>Price</u> ^(a) \$
	<u>C.I.L.</u>	<u>Du Pont</u>		
<u>Nitro- glycerin Dynamites</u>	Ditching Dynamites	Ditching Dynamites	50%	26.00
	"Stopeite"	"Extra"	65%	18.40
	"Dynamex"	"Energex"	40%	18.40
	"Cilgel"	"Gelex" -2	70%	19.25
	"Forcite"	Special Gelatin	40%	19.55
<u>AN/FO Mixtures</u>	"Amex"	"Nilite" FR	(In bags of 50 lb.)	5.50
<u>Slurries</u>	"Amite"	"Nitramite"	5" and larger	13.65 ^(b)
	"Hydromex"	"Tovex"	4" and larger	17.15 ^(c)
	"Hydromex" M-2	"Tovex" A	4" and larger	19.65 ^(d)

(a) Prices of C.I.L. explosives produced at Brainerd, Man.; Ogden, Alta. and James Island, B.C. are \$1.65 higher than at eastern plants for same grades and strengths

(b) AN/FO canned

(c) TNT slurries

(d) Metallized slurries

Source: Canadian Industries Limited, Price List No. 67, 27 January, 1964; Du Pont of Canada, Price List, dated 14 July, 1964

(1) Transcript, Vol. 106, p. 16037

(2) Same, Vol. 106, p. 16060, 16061

The nitroglycerin explosives have a wide range of prices, typically between \$15 and \$30 per hundred pounds; \$20 per hundred pounds was given as an average or representative price. Prices of blasting slurries also vary according to formulation; prices were given as around \$10 or \$12 per hundred pounds, though these prices were considered to be on the low side. Perhaps a more typical range might be \$15 to \$17 per hundred pounds in Canada. The ammonium nitrate - fuel oil mixtures are much lower in price than the other prepared explosives. A range of \$5 to \$9 per hundred pounds was indicated for these mixtures. However, it was noted that in some areas in the U.S.A. where a large number of mining companies are concentrated, for example in the Mishimack Range, prices as low as \$3.50 per hundred pounds have been quoted, though this is regarded as "extremely low".(1)

In regard to price trends for manufactured explosives, C.I.L. reported that its price index for all explosives has gone up by about 40 per cent since 1946, which is well below the average increase of prices in Canada. Prices of the nitroglycerin type explosives had remained relatively stable for some time prior to 1962, but they have experienced some increase since then. Prices of the ammonium nitrate based explosives have tended to decline in recent years.

Transportation

The hazards of shipping explosives and the relatively higher incidence of freight cost on the low-value raw materials and on some of the lower priced finished products are important considerations. The trend in the explosives industry has been towards decentralization of production, particularly in the case of AN/FO type explosives where capital costs are comparatively small. These dispersed, smaller plants forego some of the economies of scale, but it is claimed that the loss in size is offset by the reduction in transportation costs.

The transportation and storage of explosives in Canada are governed by various federal, provincial and municipal statutes and regulations. The principal federal authorities are the Explosives Division of the Department of Mines and Technical Surveys, the Board of Transport Commissioners, the Department of Transport and the St. Lawrence Seaway Authority. The Explosives Division regulates the movement of explosives by road and private railways, the Board of Transport Commissioners by the public railways, and the other two bodies by the waterways. The maximum quantity of explosives to be moved by road is 10,000 pounds; the maximum quantity to be shipped through the St. Lawrence Seaway is limited to 4,000 pounds per ship. The quantity limits applicable to ships carrying explosives in the area of the Lakehead and along the coasts are not as restrictive as those applicable in the Seaway.

The freight rates charged on explosives are subject to agreement between the carriers and the industry. Some of the agreed charges between companies and the railways for transportation of nitroglycerin type explosives are shown on the following page.

(1) Transcript, Vol. 106, p. 16014, Vol. 107, p. 16135

Selected Agreed Charges Between the Carrier
and the Shipper for Transportation of Explosives

<u>Effective Date</u>	<u>Place of Shipment and Destination</u>	<u>Agreed Charges</u>	
		Minimum Weight per Carload <u>in lb.</u>	Cents per <u>lb.</u>
February 25, 1963	Ogden, Alta. to Kimberley, B.C.	20,000	155
February 12, 1964	Ogden, Alta. to Nelson, B.C.	20,000	145
June 11, 1963	North Bay, Ont. to Parisville, Que.	30,000	119
		80,000	112
April 6, 1964	Beloeil, Que. to Gaspe, Que.	50,000	84
June 29, 1964	Beloeil, Que. to Grand Falls, Nfld.	40,000	295
		50,000	290
October 21, 1964	Beloeil, Que. to Brunswick Mines, N.B.	40,000	170
	" " to Moncton, N.B.	40,000	175
	" " to Sydney Mines, N.S.	40,000	170
	" " to Windsor, N.S.	40,000	195

Source: Canadian Freight Association, Montreal, Quebec

In regard to transportation by road, information available to the Board indicates that there is generally a minimum charge. For example for a load up to 5 tons for a return trip mileage of less than 100 miles, the minimum charge might be about \$35. Beyond the minimum, the charge will vary depending upon the class of explosives, the weight category and the distance travelled. For AN/FO explosives, not only are the freight rates lower than those applied to nitroglycerin explosives, but the regulations governing their movement are also somewhat less stringent as they are less hazardous to transport.

To ship explosives 300 or 400 miles might cost, for large shipments, something over \$20 per ton and for small shipments possibly well in excess of \$50 per ton. Thus, even for the higher priced nitroglycerin explosives, transportation costs can equal or exceed the f.o.b. factory price and, for lower priced explosives, such costs can be of even more importance. In this context, location and distance might well be factors of greater competitive significance than the f.o.b. factory price or than the differences in costs of production.

Tariff Considerations

Commercial explosives covered by this Reference are classified chiefly by the following tariff items:

<u>Tariff Item</u>		<u>B.P.</u>	<u>M.F.N.</u>
666 Nitro-glycerine, giant powder, nitro and other explosives, n.o.p.,	per lb.	1 $\frac{3}{4}$ cts.	2 $\frac{1}{4}$ cts.
667 Blasting and mining powder,	per lb.	1-1/3 cts.	1 $\frac{3}{4}$ cts.
668 Cannon, musket, rifle, gun and sporting powder and cannister powder,	per lb.	2 cts.	2 $\frac{3}{4}$ cts.

The Industry Committee and the manufacturing companies expressed the view that the present tariff on commercial explosives is out of date and that there is no clearcut distinction between the two main kinds of explosives -- propellents and explosives. It was noted that the three tariff items have remained unchanged in their terminology since 1906 and that the explosives industry has undergone considerable change since then. Products like giant powder and cannister powder, listed in tariff items 666 and 668, are either not known today or are not important in Canadian commerce.

In view of the above considerations, and because of the general international acceptance of the product classification of the Brussels Tariff Nomenclature, the Industry Committee and the manufacturing companies proposed the adoption of the relevant headings of the Brussels Nomenclature dealing with commercial explosives. Two of the headings of Chapter 36 of the B.T.N. deal with the products under review; these are 36.01, covering propellant powders (chiefly item 668), and 36.02 referring to prepared explosives, other than propellant powders (tariff items 666 and 667). The products included in these headings as described by the Brussels Explanatory Notes and included in the Industry Committee's statement are as follows:

"Heading 36.01 reads: 'Propellant Powder'. It applies to granular or powdered preparations which on being decomposed by combustion yield large volumes of gases at high temperatures. The large volume of gas is created progressively in such a manner that it can be employed to produce a propellant effect. Among the products of the heading are black powder (gunpowder) and smokeless powder.

"Heading 36.01 does not apply to:

- (a) Separate chemically defined compounds (usually Chapter 28 or 29);
- (b) Prepared explosives (36.02);
- (c) Nitrocellulose or cellulose nitrates (39.03).

"Heading 36.02 reads: 'Prepared explosives, other than propellant powders'. It applies to explosive mixtures whose decomposition, unlike that of propellant powders, is virtually instantaneous and by creating considerable pressure almost immediately produces a shattering action. The explosive mixtures appear in various forms, e.g. pastes, powders, granules, sticks and bars."⁽¹⁾

Heading 36.02 does not cover separate chemically defined compounds even though they may be explosives. These chemicals are usually included in Chapters 28 and 29, e.g. inorganic nitrates (28.39), mercury fulminate (28.44), trinitrotoluene (29.03), nitroglycerin (29.18).

Some of the single chemicals may be dutiable under items 666, 667 and 668 in the Canadian Customs Tariff; the Industry Committee and the companies making representations on explosives would classify these single chemicals under their appropriate B.T.N. headings.

Canadian Industries Limited, while agreeing in general with the Brussels scheme of classification, suggested that "the Brussels system be modified so as to include black powder under heading 36.02 as a prepared explosive rather than under heading 36.01 as a propellant. . . . Since the preponderance of usage is in blasting and mining, inclusion of all black powder under Brussels heading 36.02 seems appropriate."⁽²⁾

At a later stage in the public hearing the company spokesman said that it does not matter where black powder is classified, as long as it carries the duty rates suggested for heading 36.02.⁽³⁾

The Industry Committee, however, did not favour a change and recommended that black powder be left under 36.01. To retain consistency with the B.T.N., black powder should be classified with propellant powders regardless of use or any other reason.⁽⁴⁾

It appears that, under the B.T.N., propellant powders and prepared explosives are classified on the basis of defined chemical mixtures and chemical reaction; under the Canadian Customs Tariff, commercial explosives are classified on the basis of general description or usage, for example blasting and mining powders. The provisions of tariff items 667 and 668, moreover, are only for powder forms of explosives, whereas B.T.N. heading 36.01 provides also for other forms, e.g., cord, sticks, discs, etc.

Even the B.T.N. classification, or the interpretation of its coverage, may require revision to keep pace with developments in the industry, for example developments in AN/FO mixtures and metallized slurries. It was stated in the public hearing by the C.I.L. spokesman that the Brussels Explanatory Notes for heading 36.02

(1) Transcript, Vol. 106, p. 15992, 15993

(2) Same, Vol. 106, p. 16013

(3) Same, Vol. 106, p. 16107

(4) Same, Vol. 106, p. 15999, 16000

covering "explosive mixtures based on ammonium nitrate such as westphalites, roburites and ammonals, etc." refer to products different from AN/FO mixtures. "These [the B.T.N. mixtures] are earlier versions of the same type of things...they are extremely similar, but they preceded some of our fuel oil mixtures. They are definitely different..."(1)

Company Proposals

The principal company proposals were made by Canadian Industries Limited, the largest manufacturer of commercial explosives in Canada, and received support from Du Pont of Canada in a letter to the Board favouring rates of 15 p.c., B.P. and 20 p.c., M.F.N. for explosives under heading 36.02. The changes which C.I.L. sought in the rates of duty on the explosives covered by this report included a proposed change from specific rates to ad valorem. These proposals are now discussed by principal products and by tariff items.

Propellant Powders

Black Powder

Tariff items applicable to the import of black powder into Canada are:

<u>Tariff Item</u>	<u>B.P.</u>	<u>M.F.N.</u>
667 Blasting and mining powder, per lb.	1-1/3 cts.	1 ³ / ₄ cts.
668 Cannon, musket, rifle, gun and sporting powder and cannister powder, per lb.	2 cts.	2 ³ / ₄ cts.

Note: "Cannister powder" is an unknown term in commerce today

The use of black powder as a propellant has been declining because of replacement by smokeless propellant powders and it is mostly confined to those who load their own ammunition and who do not mind the cloud of smoke. Its use in cartridges as a propellant was stated to be very limited; its major use in Canada now is in blasting. About 90 per cent of the black powder used in Canada is made by C.I.L.; if imported, it would be classified under item 667 as a blasting powder. As far as is known, this is the only form of "blasting and mining powder" dutiable under item 667 and the item is declining in importance. The remaining 10 per cent is understood to be imported for use as a propellant under item 668.(2)

Apart from the proposal to reclassify black powder from B.T.N. heading 36.01 to heading 36.02, Canadian Industries Limited

(1) Transcript, Vol. 106, p. 16022

(2) Same, Vol. 106, p. 16013

proposed that the duty on black powder be changed from the existing specific rates to ad valorem rates of 15 p.c., B.P. and 20 p.c., M.F.N.

Imports of black powder in recent years were very small; 500 pounds in 1963, valued at \$169 under item 667, and 89,000 pounds, valued at \$49,271 under item 668; imports under item 668 are chiefly from the U.K.

C.I.L. did not present arguments in support of this change in duty except that ad valorem rates of duty were preferable for commercial explosives and that, for products made in Canada, the rates should uniformly be 15 p.c., B.P. and 20 p.c., M.F.N. and not vary depending on the price of the explosive.

The ad valorem equivalent of the specific rate of duty paid on imported black powder has varied from year to year depending on the price of the powder imported. In 1959, under tariff item 667, the ad valorem rate amounted to about 15 p.c. when the average value of imported black powder was 15 cents a pound; in 1963, it amounted to about 5 p.c. with the average value of imported powder 34 cents a pound. When related to the average value of imports of black powder, from the U.S.A., for the five years 1959-63, the ad valorem equivalent of the specific duty amounted to 14.3 p.c., M.F.N. There were no imports of black powder under item 667 at the British Preferential rate.

Similarly, when the average value of imports of black powder per pound from the United Kingdom under item 668 is considered, the ad valorem equivalent of the specific B.P. rate of duty is about 4.2 p.c. Based on average values of imports, varying between 29 cents and 50 cents a pound, the ad valorem equivalent ranges from 4 p.c. to 7 p.c. There have been no imports of black powder in recent years from M.F.N. countries under item 668.

The proposed duties of 15 p.c., B.P. and 20 p.c., M.F.N. are, therefore, well above the equivalent present rate on imports from M.F.N. countries under item 667, and more than triple the estimated ad valorem equivalent of the present B.P. rate under item 668. Further, if the increased duty were borne by the consumer, the average price of black powder when imported from the U.S.A. would increase more than 2 cents a pound and that from Britain by a little less than 2 cents a pound, though the amounts involved are very small.

The market for black powder in Canada has been declining and 90 per cent of the market is met by domestic production. There is no evidence that competition from imports is having any appreciable effect on the Canadian producer.

Smokeless Powders

Smokeless propellant powders are not currently produced in Canada; they are imported from the U.S.A. under item 668:

<u>Tariff Item</u>	<u>B.P.</u>	<u>M.F.N.</u>
668 Cannon, musket, rifle, gun and sporting powder, per lb.	2 cts.	2 $\frac{3}{4}$ cts.

Note: Sporting powder is an old term, not generally used now;
cannister powder is an unknown term in commerce today

Canadian Industries Limited, the largest importer and consumer of smokeless powders in Canada, proposed that smokeless propellant powders be listed under heading 36.01, duty free, under both the B.P. and M.F.N. Tariffs until made in Canada. When produced in Canada, they should be subject to the rates provided for the heading, namely 15 p.c., B.P., 20 p.c., M.F.N. Other companies using smokeless powders did not make submissions to the Board.

C.I.L. argued that, since smokeless powders are not produced in Canada, any duty on these powders is unnecessary and only creates a burden on consumers of ammunition in Canada. C.I.L. did not see any likelihood of the manufacture of these powders in Canada in the near future because of the limited domestic market and because exports to the U.S.A. faced a 30 p.c. import duty. In view of the similarity in ballistic requirements in the two countries, the United States was cited as the only possible external market for these powders if produced in Canada.⁽¹⁾

When the specific rate of duty of 2 $\frac{3}{4}$ ¢ a pound M.F.N. is converted to an ad valorem rate, based on a price of one dollar per pound or more for smokeless powders imported from the U.S.A., it is equivalent to less than 3 p.c.

Because C.I.L., the principal user of smokeless propellant powders in Canada, indicated that the market would unlikely justify the manufacture of these powders in Canada in the foreseeable future, the effect of the company's proposal for duty-free entry until they are made in Canada would be a slight reduction in existing rates of duty.

Prepared Explosives

Two groups of products are dealt with under this heading: nitroglycerin type explosives and blasting agents.

Nitroglycerin Explosives (Dynamites)

Nitroglycerin types of explosives are produced in Canada; when imported, they are entered under tariff item 666.

<u>Tariff Item</u>	<u>B.P.</u>	<u>M.F.N.</u>
666 Nitro-glycerine, giant powder, nitro and other explosives, n.o.p., per lb.	1 $\frac{3}{4}$ cts.	2 $\frac{1}{4}$ cts.

Note: "giant powder" was a trade name for a type of dynamite no longer known by this name

⁽¹⁾ Transcript, Vol. 107, p. 16150

Although import data are not available separately for nitroglycerin explosives, available information suggests that imports in recent years have amounted to not more than 50,000 pounds, valued at less than \$15,000 a year. Imports are likely to fluctuate considerably from one year to another, particularly if the requirements of some unusually large construction or demolition project such as the St. Lawrence Seaway or the blasting of Ripple Rock are met in large part by imported explosives. The U.S.A. is the source of imports of these explosives. Provision has been for duty-free entry of explosives from the U.S.A., or for remission of duties, for joint-defence projects, such as the Dew Line, and for other international construction projects, such as the St. Lawrence Seaway.

C.I.L., one of the main producers of the nitroglycerin explosives, recommended that these explosives be classified under B.T.N. heading 36.02 at rates of 15 p.c., B.P. and 20 p.c., M.F.N. Du Pont of Canada supported these rates under the company's general support for B.T.N. 36.02.⁽¹⁾

The arguments put forward by C.I.L. in support of the proposed rates dealt principally with:

- (a) the surplus capacity which is developing abroad, with the possible decline in prices and the consequent inadequacy of existing rates;
- (b) the possibility of higher costs of production if some of the raw materials which can now be imported free of duty become dutiable as proposed in some of the submissions before the Board;
- (c) Canadian production of these types of explosives should be encouraged, and
- (d) any increase in the price of these explosives would not materially affect costs to the users.

Some indication of the company's argument on each of these points is given by the following statements:

- (a) "with respect to nitroglycerin explosives, we believe that our proposals are justified by the need for an effective deterrent to explosives imports in view of the surplus productive capacity that now exists in the United States and will doubtless develop elsewhere.

"...the threat of surplus capacity may result in having an effect on domestic price level in U.S.A. and the substantial movement of high explosives into Canada...

"...we feel that the free to 11 or 12% protection afforded nitroglycerin explosives at the present time may well be less than adequate..."⁽²⁾

⁽¹⁾ Transcript, Vol. 106, p. 16027

⁽²⁾ Same, Vol. 106, p. 16015, Vol. 107, p. 16126, 16127

- (b) "A further consideration underlying our proposals respecting duty rates on nitroglycerin explosives is that if the Board accepts the representations already made by several members of the chemical industry that 'end-use' items be eliminated, the duty rates on glycerin and ethylene glycol, the starting point for nitroglycerin manufacture, would become 15% B.P. and 20% M.F.N., whereas these materials currently enter duty free for explosives manufacture."⁽¹⁾
- (c) Although the Canadian market for nitroglycerin explosives has been witnessing a sharp decline, the company mentioned that in some uses these types had advantages, that the market for them will stabilize and that continued manufacturing of nitroglycerin based explosives would be in the national interest.
- "To shut down a nitroglycerin operation ... is a major step and completely eliminates production of nitroglycerin from that particular plant location ... sufficient encouragement [should] be given to the nitroglycerin manufacturing end of the industry to assure its continued existence."⁽²⁾
- (d) It was argued that the increase in the duty will result in an insignificant burden on the consumers of this explosive, as "the cost of explosives to metal mines is only 1% of their total cost".⁽³⁾ (A later statement by the company spokesman indicated that it was the gross value of shipments of minerals and metals, not cost of production, on which this comparison was made).⁽⁴⁾

Most of the commercial and industrial factors which bear upon the company's arguments have been presented in the preceding sections.

At an average price of \$20 per 100 pounds for nitroglycerin type explosives, the existing M.F.N. specific rate of duty is approximately equivalent to 11 p.c. on an ad valorem basis. The company's proposal, therefore, is for an approximate doubling of the existing M.F.N. rate as long as the nitroglycerin explosives are in the present price range.

It should be noted that the proposal for increased rates of duty was made not because imports of these types of explosives had increased to any appreciable extent but because the possibility was foreseen of a threat developing from increased imports at some time in the future. The spokesman for C.I.L. noted that existing imports often consisted of special types or grades of explosives which tended to be those with somewhat higher values.

(1) Transcript, Vol. 106, p. 16016

(2) Same, Vol. 106, p. 16043, 16050, 16051

(3) Same, Vol. 106, p. 16010

(4) Same, Vol. 106, p. 16054

Surplus capacity for the manufacture of nitroglycerin explosives must almost certainly exist for a time throughout the world, with the advent of new types of explosives which have pre-empted a large part of the market formerly served by the nitroglycerin types. Some reduction in the price of the nitroglycerin explosives might be expected to result from this development, but a very large part of the impact has now been felt. The nitroglycerin explosives, as has been noted, have advantages for some uses over the less expensive explosives, and for these uses presumably can maintain a higher price. In their own range of products they face competition from similar types, such as explosives based on trinitrotoluene and binitrotoluene. Moreover, surplus capacity also exists in Canada and the Canadian producer undoubtedly will strive to maintain his production as competitively as possible. Canadian production in the past has been very competitive and prices of these explosives in Canada were said to be relatively low.

"...over the years, ... Canadian prices of explosives have been consistently lower than the delivered cost of U.S. counterparts; in fact this tendency has been accentuated by the recent swing in exchange rate..."

Further it was mentioned that "Canadian explosives' prices are among the lowest in the world. If any flow of explosives from other countries developed the chances would be that the prices that were being charged were lower than those charged in the country of origin."⁽¹⁾

If this situation developed, the domestic industry could have recourse to the anti-dumping provisions of the Customs Tariff.

The argument noted above as (b) -- that the costs of some materials might be higher because of other proposals before the Board -- referred particularly to the duty on ethylene glycol and glycerine. This could be an important consideration since these materials are significant elements of cost in the manufacture of nitroglycerin explosives. However, neither C.I.L. nor any other manufacturer of nitroglycerin explosives opposed the proposals for increased rates of duty on the above materials.

The arguments noted above as (c) and (d) -- the advantage of encouraging the retention of the industry, and the effect on the costs of users -- are general considerations before the Board; no special or particular factors were introduced here.

Blasting Agents

The term "blasting agents" is used to refer to prepared blasting explosives, principally of two types: (a) AN/FO mixtures and (b) slurries. They are entered under tariff item 666, "Explosives, n.o.p.". The term is not used to refer to blasting powders of item 667.

(1) Transcript, Vol. 106, p. 16037, 16049

<u>Tariff Item</u>		<u>B.P.</u>	<u>M.F.N.</u>
666	Nitro-glycerine, giant powder, nitro and other explosives, n.o.p.	per lb. 1 $\frac{3}{4}$ cts.	2 $\frac{1}{4}$ cts.

Note: "giant powder" is no longer a term of commerce in Canada

Item 666, of course, provides also for other products most of which are nitroglycerin explosives dealt with above. It also provides for a large number of explosive compounds dealt with elsewhere in the report as separate chemical compounds. These are included in the list of products at the end of this section.

C.I.L. recommended that blasting agents be subjected to the same rates of duty as other explosives: 15 p.c., B.P. and 20 p.c., M.F.N.

The arguments put forward by the company in favour of the change were:

(a) C.I.L. objected to the specific rates of duty on explosives, particularly under tariff item 666 which covers single chemicals and explosive mixtures. The company spokesman stated that:

"Since explosive mixtures vary greatly in price per pound, it seems illogical for all of them to attract the same duty per pound, yet this is substantially the effect of the present duty structure. The ad valorem equivalent of the existing specific duty under tariff item 666 (based on United States fair market value) would vary from less than 3% to more than 40%." ⁽¹⁾

(b) The changing structure of the Canadian explosives market from nitroglycerin (dynamites) to cheaper explosives -- AN/FO and slurries -- was claimed to have had

"...a profound effect on the explosives business on this continent, and the company's recommendations are designed to bring the tariff structure into line with the radically changed conditions of the industry." ⁽²⁾

(c) "The proposed rates represent a sharp reduction in the ad valorem equivalent of duties now applicable on the lower priced blasting agents as the present rates of up to 40% on these products can no longer be justified". ⁽³⁾

(d) "The recommended rates also reflect the fact that a duty rate of 15% B.P., 20% M.F.N. has been proposed by certain Canadian manufacturers of ammonium nitrate, which constitutes as much as 80% of the total factory cost of ammonium nitrate - fuel oil mixtures". ⁽⁴⁾

(1) Transcript, Vol. 106, p. 16012, 16013

(2) Same, Vol. 106, p. 16014

(3) Same, Vol. 106, p. 16015

(4) Same, Vol. 106, p. 16015

(The company indicated that, as a potential producer of ammonium nitrate for sale, it was sympathetic to the recommendation for these rates of duty.)

The effect of replacing the specific rates of duty with ad valorem rates would, of course, increase relatively the protection on the higher-priced blasting explosives, the slurries, while reducing it on the lower-priced explosives, the AN/FO mixtures.

The volume of imports of prepared blasting explosives is believed to be small and there is no evidence that the existing rates of duty are the principal factor in this low volume of imports. Nor is it likely that the proposed rates would be the principal determinant of the volume of imports. Costs of transportation and difficulties of long distance shipment are likely to be more important. Speaking of the lowest cost blasting explosives, the spokesman for C.I.L. said:

"certainly at present the low-cost mixtures, namely, the scrap ammonium nitrate - fuel oil mixtures, are selling in the neighbourhood of \$5 per one hundred pounds f.o.b. plants, and at the present time these mixtures are certainly not coming in in any significant volume."(1)

General

Most of the imports of explosives and propellant powders are of the relatively higher-priced types for which the existing specific rates represent ad valorem equivalents of from 4 to 10 p.c. Moreover, as noted above, the lower-priced explosives, for which the existing rates do constitute a greater deterrent to imports, are restricted in movement by transportation costs and regulations and by the location of Canadian manufacture.

Except for the proposal for duty-free entry of smokeless propellant powders, while these are not made in Canada, the proposed rates of duty (15 p.c., B.P., 20 p.c., M.F.N.) represent generally a substantial increase in the level of protection on the basis of the present pattern of imports. However, the proposals were made chiefly from the point of view of changing the classification of products and of changing the structure of rates from the existing specific rates to ad valorem rates. The ad valorem rates were those proposed generally by the chemical industry. They were not put forward as being in any way uniquely determined by the needs of the manufacturers of explosives. With respect, for example, to the cheapest of the blasting explosives, the AN/FO mixtures, the spokesman for C.I.L. indicated the company's new plant at Sudbury, Ontario was "probably the most modern and efficient plant of its kind in North America."(2)

As has been noted throughout this section of the report, a number of chemical compounds are used directly as explosives or are used in the manufacture of prepared explosives. These chemicals are dealt with under the appropriate B.T.N. classification. Among the most important of these compounds are:

(1) Transcript, Vol. 107, p. 16133

(2) Same, Vol. 106, p. 16015

<u>Chemical Substance</u>	<u>B.T.N. Heading</u>
Ammonium nitrate	31.02
Potassium nitrate	28.39
Sodium nitrate	28.39
Trinitrotoluol	29.03
Binitrotoluol	29.03
Nitrocellulose	39.03
Alkali dichromates	28.47
Nitroglycerol (nitroglycerin)	29.18
Pentaerythritol tetranitrate (penthrite)	29.18
Mercury fulminate	28.44
Trinitrobenzene	29.03
Nitroguanidine	29.26
Trimethylene trinitramine	29.26
Trinitrophenol	29.07
Sulphur, other than sublimed, etc.	25.03

End-Use Tariff Items

There are in the Canadian Customs Tariff a number of "end-use" tariff items which provide duty-free entry for certain specified materials when for use in the manufacture of explosives. These items are dealt with in the sections of the report dealing with the specific materials or in that part of the report dealing with end-use. The important materials and end-use items are:

<u>Tariff Item</u>	<u>Short Description</u>	<u>Relevant B.T.N. Heading</u>
207b	Ethylene glycol	29.04
664(2)	Glycerine	15.11
664a	Nitrate compounds, n.o.p. (strontium nitrate)	28.39(1)
758	Binitrotoluol, Trinitrotoluol	29.03
666	Nitrocotton	39.03
758	Perchlorate of ammonia	28.32

(1) Inorganic nitrates

APPENDIX IStatistical TablesImports

<u>Table</u>		<u>Page</u>
1	Surface-active agents, compounded	104
2	Detergents, powder or liquid	104
3	Cleaning compounds, sodium base	105
4	Washing and cleaning preparations, n.o.p.	106
5	Detergents, dispersing, emulsifying, wetting and other surface-active agents	107
6	U.S. exports of detergents, surface-active agents and other cleaning compounds, to Canada, 1959-64	108
7	Blasting and mining powder	109
8	Dynamite and nitro-glycerine	110
9	Gun, rifle, sporting, cannon, musket and cannister powder	111
10	Explosives, n.o.p.	113
11	Explosives and blasting agents, n.e.s.	114
12	Explosives imported into Canada	115

Exports

1	Soap and detergents	116
2	Cleaning and polishing preparations and household chemical specialties	117

Other Statistics

1	Estimated production of surface-active agents in Canada, 1958-64	118
2	Prices of principal raw materials used in surface- active agent manufacture, Canada and U.S.A.	119
3	Canadian and U.S. selling prices of surface-active agents and cost of materials used in their manufacture	120

Table 1

Imports: Surface active agents, compounded, s.c. 429-79^(a)

Tariff Items 208t, 220a(i) and 711

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
			<u>1. Total</u>			
1964	23,901	5,741	.24	4,776	804,714	16.8
			<u>2. United Kingdom</u>			
1964	2,676	416	.16	238	35,374	14.9
			<u>3. United States</u>			
1964	20,789	5,231	.25	4,450	753,656	16.9

(a) Prior to 1964 included in s.c. 8264, 8366 and 8415

Table 2

Imports: Detergents, powder or liquid, s.c. 8245^(a)

Tariff Items 208t, 220a(i), 228(ii) and 711

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
	1. Total					
1962	6,126	1,319	.22	1,313	262,048	20.0
1963	5,119	1,017	.20	1,006	194,694	19.4
1964	4,218	829	.20	..	..	..
	2. United States					
1962	6,125	1,318	.22	1,312	261,871	20.0
1963	5,111	1,015	.20	1,003	194,213	19.4
1964	4,203	821	.20	..	..	..

(a) Prior to 1962 included in s.c. 8234, 8235, 8337 and 8415;
beginning in 1964 renumbered as s.c. 800-68

Table 3

Imports: Cleaning compounds, sodium base, s.c. 8337^(a)

Tariff Items 208t, 220a(i) and 711

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as</u> <u>p.c. of</u> <u>Dutiable</u> <u>Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
				(000)		
<u>1. Total</u>						
1953	7,421	785	.11	785	150,365	19.2
1954	8,178	912	.11	912	177,378	19.5
1955	11,923	1,366	.11	1,359	263,010	19.4
1956	15,888	1,959	.12	1,941	379,003	19.5
1957	18,102	2,363	.13	2,346	465,117	19.8
1958	18,137	2,657	.15	2,642	519,277	19.7
1959	18,670	2,569	.14	2,524	498,092	19.7
1960	22,428	3,238	.14	3,141	614,223	19.6
1961	24,506	3,583	.15	3,523	693,665	19.7
<u>2. United States</u>						
1953	7,419	784	.11	784	150,247	19.2
1954	8,177	912	.11	912	177,369	19.5
1955	11,914	1,365	.11	1,358	262,834	19.4
1956	15,794	1,950	.12	1,935	378,066	19.5
1957	18,083	2,360	.13	2,346	465,117	19.8
1958	18,128	2,656	.15	2,642	519,277	19.7
1959	18,661	2,567	.14	2,523	497,877	19.7
1960	22,362	3,232	.14	3,136	613,403	19.6
1961	24,487	3,581	.15	3,521	693,353	19.7

(a) Beginning in 1962 included in s.c. 8245, 8246 and 8415

Table 4

Imports: Washing and cleaning preparations, n.o.p., s.c. 8246^(a)

Tariff Items 208t, 220a(i), 252 and 711

<u>Year</u>	<u>Total Imports</u> \$ (000)	<u>Dutiable Value</u> \$ (000)	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>1. Total</u>				
1962	3,739	3,727	752,456	20.2
1963	3,891	3,871	778,316	20.1
1964	2,888	..	..	..
<u>2. United States</u>				
1962	3,722	3,711	749,385	20.2
1963	3,837	3,817	770,048	20.2
1964	2,861	..	..	..

(a) Prior to 1962 included in s.c. 8337, 8413 and 8415; beginning in 1964 renumbered as s.c. 800-73

Imports: Detergents, dispersing, emulsifying, wetting and other surface active agents, 1956-62

Products	Usual Tariff Items	Statistical Class	Principal Countries	1956 \$'000	1957 \$'000	1958 \$'000	1959 \$'000	1960 \$'000	1961 \$'000	1962 \$'000
Alkanolamides, amides, amines and other fatty acid derivatives	208t 220a(i) 711	8415 8264	Britain W. Germany Switzerland U. States	670	630	515	880	935	995	1,300
Alkylaryl hydrocarbon unsulphonated	269b	7185 8415	U. States	1,940	2,120	1,220	410	50	..	105
Alkyl aryl sulphonates	208t 220a(i) 711 851	8366 8415 8337	Britain U. States	785	515	660	710	815	1,410	1,770
Alkyl sulphates	208t 220a(i) 711	8264 8366 8415	Britain W. Germany U. States	514	430	370	390	425	570	470
Ethyleneoxide condensates	208t 220a(i) 711 921	8415 8422	Britain U. States	810	1,025	1,025	1,260	1,095	1,425	1,525
Quaternary ammonium salts	208t 220a(i) 711	8264 8366 8415	Britain W. Germany U. States	80	105	160	205	350	100	..
Not further identified	208t 220a(i) 711 921	8415		-	-	-	-	-	-	625
TOTAL:				4,799	4,825	3,950	3,855	3,670	4,500	5,795

Source: Department of Industry, Chemical Import Trends

Table 6

U.S. Exports of Detergents, Surface-Active Agents
and Other Cleaning Compounds, to Canada,

1959-64

	<u>1959</u>		<u>1960</u>		<u>1961</u>		<u>1962</u>		<u>1963</u>		<u>1964</u>	
	Quan- tity lb. (000)	Value \$ (000)	Quan- tity lb. (000)	Value \$ (000)	Quan- tity lb. (000)	Value \$ (000)	Quan- tity lb. (000)	Value \$ (000)	Quan- tity lb. (000)	Value \$ (000)	Quan- tity lb. (000)	Value \$ (000)
Detergent alkylates, organic surface-active agents	2,001	268	344	47	221	32	212	56	321	49	168	33
Detergent intermediates, n.e.c., organic surface- active agents	7,693	1,294	7,449	1,022	10,457	1,220	7,214	1,025	5,531	649	3,123	477
Detergents, all types, organic surface-active agents	21,368	3,453	18,017	2,903	21,466	3,308	11,728	2,251	12,358	2,635	9,881	2,206
Organic surface-active agents, n.e.c.	6,027	1,707	8,549	2,010	6,931	1,819	7,764	1,973	9,155	2,360	11,333	2,602
Specialty cleaning and washing compounds, n.e.c.	18,574	3,785	20,447	4,183	14,695	3,515	14,444	3,568	12,386	3,253	13,232	3,582
TOTAL	55,662	10,508	54,807	10,165	53,770	9,894	41,362	8,873	39,750	8,946	37,736	8,900

Source: United States Exports, U.S. Department of Commerce, Bureau of the Census, Catalogue No. FT410

Table 7

Imports: Blasting and mining powder, s.c. 8133

Tariff Item 667

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
				(000)		
<u>1. Total</u>						
1953	106	15	.14	15	1,862	12.6
1954	69	9	.14	9	1,199	12.9
1955	104	29	.28	29	1,826	6.3
1956	77	16	.21	16	1,340	8.4
1957	21	3	.16	3	363	11.0
1958	1	1	.56	1	18	3.2
1959	51	7	.15	7	1,143	15.3
1960	132	18	.13	18	2,561	14.6
1961	51	8	.16	8	1,143	13.8
1962	2	1	.40	1	36	4.5
1963	1	*	.34	*	9	5.3
<u>2. United States</u>						
1953	106	15	.14	15	1,862	12.6
1954	69	9	.14	9	1,199	12.9
1955	104	29	.28	29	1,826	6.3
1956	77	16	.21	16	1,340	8.4
1957	21	3	.16	3	363	11.0
1958	1	1	.56	1	18	3.2
1959	51	7	.15	7	1,143	15.3
1960	132	18	.13	18	2,561	14.6
1961	51	8	.16	8	1,143	13.8
1962	2	1	.40	1	36	4.5
1963	1	*	.34	*	9	5.3

Table 8

Imports: Dynamite and Nitro-glycerine, s.c. 8134 (a)

Tariff Item 666

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$	\$	
				(000)		
<u>1. Total</u>						
1953	10	9	.94	9	221	2.4
1954	43	25	.58	25	972	3.9
1955	10	5	.45	5	232	5.0
1956	9	4	.44	4	211	5.2
1957	1,298	285	.22	139	13,676	9.9
1958	1,358	258	.19	3	182	5.5
1959	15	8	.56	8	329	4.0
1960	14	5	.41	5	306	5.6
1961	12	8	.65	8	264	3.5
1962	12	7	.59	7	329	4.5
1963	46	14	.30	5	190	3.5
<u>2. United States</u>						
1953	10	9	.94	9	221	2.4
1954	43	25	.58	25	972	3.9
1955	10	5	.45	5	232	5.0
1956	9	4	.44	4	211	5.2
1957	1,298	285	.22	139	13,676	9.9
1958	1,358	258	.19	3	182	5.5
1959	15	8	.56	8	329	4.0
1960	14	5	.41	5	306	5.6
1961	12	8	.65	8	264	3.5
1962	12	7	.59	7	329	4.5
1963	46	14	.30	5	190	3.5

(a) Includes duty-free imports for joint Canadian - U.S. projects, particularly in 1957, 1958 and 1963; beginning in 1964, included in s.c. 415-69

Imports: Gun, rifle, sporting, cannon, musket and cannister powder,
s.c. 8137^(a)

Tariff Item 668

Year	Total Imports		Unit	Dutiable	Duty	Duty as
	lb.	\$	Value	Value	Collected	p.c. of
	(000)	(000)	\$/lb.	\$	\$	Dutiable
				(000)		Value
<u>1. Total</u>						
1953	1,026	1,063	1.04	1,063	27,826	2.6
1954	1,422	1,486	1.04	1,486	37,577	2.5
1955	1,236	1,227	.99	1,227	33,330	2.7
1956	580	530	.91	530	15,068	2.8
1957	540	403	.75	403	14,035	3.5
1958	564	536	.95	536	15,220	2.8
1959	573	394	.69	394	15,179	3.9
1960	391	395	1.01	395	10,512	2.7
1961	432	462	1.07	462	11,584	2.5
1962	425	448	1.06	448	11,554	2.6
1963	506	548	1.08	548	13,456	2.5
1964	492	526	1.07	..	..	..
<u>2. United Kingdom</u>						
1953	65	22	.34	27	1,292	5.9
1954	204	90	.44	90	4,070	4.5
1955	88	27	.31	27	1,755	6.5
1956	119	35	.29	35	2,382	6.8
1957	107	32	.30	32	2,139	6.8
1958	38	13	.34	13	750	5.9
1959	78	29	.37	29	1,556	5.5
1960	34	13	.37	13	686	5.5
1961	41	20	.50	20	817	4.0
1962	38	25	.65	25	760	3.1
1963	89	49	.55	49	1,780	3.6
1964	83	53	.64	..	..	..

Table 9
(Cont'd)

<u>Year</u>	<u>Total Imports</u>		<u>Unit</u>	<u>Dutiable</u>	<u>Duty</u>	<u>Duty as p.c. of Dutiable Value</u>
	<u>lb.</u>	<u>\$</u>	<u>Value</u>	<u>Value</u>	<u>Collected</u>	
	(000)	(000)	\$/lb.	\$(000)	\$	
<u>3. United States</u>						
1953	961	1,041	1.08	1,041	26,534	2.5
1954	1,218	1,396	1.15	1,396	33,507	2.4
1955	1,148	1,200	1.05	1,200	31,575	2.6
1956	460	494	1.07	494	12,661	2.6
1957	433	372	.86	372	11,896	3.2
1958	526	524	1.00	524	14,470	2.8
1959	495	365	.74	365	13,623	3.7
1960	350	362	1.04	362	9,622	2.7
1961	370	410	1.11	410	10,182	2.5
1962	371	402	1.08	402	10,369	2.6
1963	415	496	1.19	496	11,628	2.3
1964	393	456	1.16	..	..	..

(a) Beginning in 1964 renumbered to s.c. 415-09
"Gunpowder and similar powder"

Table 10

Imports: Explosives, n.o.p., s.c. 8138^(a)

Tariff Item 666

Year	Total Imports		Unit Value	Dutiable Value	Duty Collected	Duty as p.c. of Dutiable Value
	lb. (000)	\$ (000)	\$/lb.	\$ (000)	\$	
<u>1. Total</u>						
1953	940	341	.36	341	20,991	6.1
1954	833	305	.37	289	17,368	6.0
1955	393	329	.84	329	8,117	2.5
1956	322	257	.80	253	6,941	2.7
1957	489	364	.74	364	10,998	3.0
1958	3,585	875	.24	875	80,651	9.2
1959	753	352	.47	352	16,799	4.8
1960	3,702	854	.23	784	78,811	10.1
1961	462	182	.39	81	9,875	12.2
1962	1,110	582	.52	134	23,145	17.3
1963	1,979	536	.27	369	57,985	15.7
<u>2. United Kingdom</u>						
1953	30	16	.54	16	530	3.3
1954	47	45	.95	45	827	1.9
1955	130	122	.94	122	2,277	1.9
1956	1	*	.46	*	18	3.8
1957	2	10	5.30	10	32	.3
1958	1	4	7.43	4	11	.2
1959	27	23	.87	23	473	2.0
1960	4	4	.90	4	143	3.8
1961	*	*	.62	*	6	10.9
1962	435	211	.49	10	296	2.9
1963	1,696	239	.14	238	32,527	13.7
<u>3. United States</u>						
1953	909	325	.36	325	20,461	6.3
1954	786	261	.33	245	16,541	6.8
1955	263	207	.79	206	5,840	2.8
1956	320	256	.80	253	6,923	2.7
1957	487	354	.73	354	10,966	3.1
1958	3,584	871	.24	871	80,640	9.3
1959	726	328	.45	328	16,326	5.0
1960	3,698	850	.23	780	78,668	10.1
1961	462	182	.39	81	9,869	12.2
1962	656	359	.55	112	20,274	18.1
1963	266	286	1.07	119	22,900	19.2

^(a) Beginning in 1964, included in s.c. 415-69

Imports: Explosives and blasting agents n.e.s., s.c. 415-69^(a)

Tariff Items 441, 665a, 666 and 667

<u>Year</u>	<u>Total Imports</u> \$	<u>Dutiable Value</u> \$	<u>Duty Collected</u> \$	<u>Duty as p.c. of Dutiable Value</u>
<u>1. Total</u>				
1964	491,006	323,235	40,067	12.4
<u>2. United Kingdom</u>				
1964	65,040	53,190	4,857	9.1
<u>3. United States</u>				
1964	425,966	270,045	35,210	13.0

(a) Prior to 1964 included in s.c. 8133, 8134, 8136 and 8138

Table 12

Explosives Imported into Canada, 1963 and 1964

<u>Class</u>	<u>Description</u>	<u>Unit</u>	<u>1963</u>	<u>1964</u> ^(a)
			<u>Quantity</u>	
I	Gunpowder.....	lb.	12,500	58,965
II	Nitrate mixtures.....	lb.	1,090	500
III	Nitro-compounds:			
	Blasting Explosives.....	lb.	211,220	500
	Propellents.....	lb.	42,110	103,924
	For use in explosives factories.....	lb.	2,081,619	1,167,912
	For other manufacturing purposes.....	lb.	4,477,374	4,654,000
VI	Primers.....	no.	2,230,178	5,750,000
	Safety fuse.....	feet	6,000	433,000
	Safety cartridges ^(b)	round	44,570,915	28,345,000
	Detonating fuse.....	feet	476,685	238,500
	Seismic explosives.....	lb.	62,327	348,156
	Detonators.....	no.	319,085	851,274
VII	Manufactured fireworks.....	lb.	923,322	1,136,700
	Miscellaneous.....	lb.	28,589	95,430

(a) Preliminary

		<u>1963</u>	<u>1964</u>
(b)	Military surplus.....	656,978	Not available
	.22 calibre and blanks.....	28,303,130	" "
	Other.....	15,610,807	" "

Source: Dept. of Mines and Technical Surveys, Explosives Division,
Annual Report

Table 1

Exports: Soap and detergents, s.c. 800-69^(a)

<u>Year</u>	<u>Domestic</u> \$ (000)	<u>Re-Exports</u> \$ (000)
	<u>1. Total</u>	
1960	38	1
1961	104	19
1962	83	19
1963	169	17
1964	204	..
	<u>2. United Kingdom</u>	
1960	*	--
1961	37	--
1962	26	--
1963	83	..
1964	102	..
	<u>3. United States</u>	
1960	6	1
1961	8	19
1962	23	19
1963	30	..
1964	28	..
	<u>4. Trinidad and Tobago</u>	
1960	18	--
1961	3	--
1962	8	--
1963	10	..
1964	15	..

(a) Prior to 1961 included in s.c. 8300, 8305, 8310 and 8490;
beginning in 1962 includes part of s.c. 429-99

Table 2

Exports: Cleaning and polishing preparations and household chemical specialties, s.c. 800-99(a)

<u>Year</u>	<u>Domestic</u> \$ (000)	<u>Re-Exports</u> \$ (000)
<u>1. Total</u>		
1961	476	12
1962	635	38
1963	623	92
1964	890	..
<u>2. United Kingdom</u>		
1961	9	*
1962	9	*
1963	60	..
1964	153	..
<u>3. United States</u>		
1961	357	10
1962	356	25
1963	338	..
1964	347	..

(a) Includes only material shipped in retail packages (bulk shipments of most similar preparations are 429-99); Prior to 1961 included in various statistical classes; beginning in 1962 includes part of s.c. 429-99

Table 1

Estimated Production of Surface-Active Agents in Canada, 1958-64
(millions)

Type of Product	1958		1959		1960		1961		1962		1963		1964	
	lb.	\$	lb.	\$	lb.	\$	lb.	\$	lb.	\$	lb.	\$	lb.	\$
For use in retail detergents(a)														
Packaged Powder	35.7	10.1	35.5	10.0	37.6	10.3	39.0	10.3	40.7	10.3	41.9	9.9	43.7	10.4
Packaged liquid	11.6	4.2	13.9	5.4	14.5	5.4	16.0	5.8	19.9	7.1	22.0	7.0	23.7	7.6
Sub-total	47.3	14.4	49.4	15.4	52.1	15.7	55.0	16.1	60.6	17.4	63.9	16.9	67.4	18.0
For use in industrial detergents(b)														
Bulk-bars & cartons	5.3	0.8	5.7	0.8	7.3	1.1	8.9	1.2	9.4	1.3	11.9	1.6	13.5	1.8
Bulk-liquid & pastes	4.9	0.5	7.6	1.0	12.8	2.1	13.1	2.2	20.8	4.0	11.0	2.6	18.0	3.9
Sub-total	10.2	1.3	13.3	1.8	20.1	3.2	22.0	3.4	30.2	5.3	22.9	4.2	31.5	5.7
For miscellaneous use(c)														
Floor waxes, polishes, insecticides, textiles, mining, leather processing, etc.	13.8	4.6	15.0	5.0	17.3	5.5	18.4	5.7	21.7	6.6	20.8	6.1	23.7	6.9
Grand total	71.3	20.3	77.7	22.2	89.5	24.4	95.4	25.2	112.5	29.3	107.6	27.2	122.6	30.6

- (a) (i) In packaged powder, detergents, surfactants used - 24% of factory value and 20 to 25% of weight of detergent
(ii) In packaged liquid, detergents, surfactants used - 37% of factory value and 30 to 35% of weight of detergent
- (b) (i) In bulk bars and cartons, surfactants used - 32% of factory value and 40% of weight
(ii) In bulk liquid, surfactants used - 82% of factory value and 85% of weight
- (c) The companies estimate for 1959, given in their joint submission, is projected by the rate of change in the total of retail and industrial detergents

Source: Transcript, Vol. 44, p. 6576-8, for 1959; others estimated on this basis using D.B.S. shipment figures, Cat. No. 46-214

Table 2

Prices of Principal Raw Materials Used in
Surface-Active Agent Manufacture, Canada and U.S.A.

<u>Chemical</u>	<u>Quantity</u>	<u>Canada</u>		<u>U.S.A.</u>	
		<u>Price</u> (a)	<u>Shipping</u> <u>Terms</u>	<u>Price</u> (b)	<u>Shipping</u> <u>Terms</u>
		\$ Can. /100 lb.		\$ U.S. /100 lb.	
Caustic Soda 76%(d)	T/C	3.10	F.o.b.	2.90	F.o.b.
Do Decyl Benzene(e)	T/C	11.50	F/E	11.50	F/E
Diethanolamine	T/T	26.50	Del.	24.50	Del.
Ethylene Oxide	T/C	17.00	Del.	15.50	Del.
Mono Isopropanol-amine	C/L Drs.	30.95	Del.	27.50	Del.
Monoethanolamine	T/T	27.00	Del.	25.00	Del.
Methanol	T/L Drs.	11.31	Del.	9.80	Del.
Nonene	T/T	4.53	Del.	3.90	Del.
Oleum 20%	T/C	1.38	F.o.b.	1.25	F.o.b.
Phenol	T/T	18.50	Del.	17.50	Del.
Sodium Tripolyphosphate	C/L Bulk	9.00	F.o.b.	7.35	F/E
Sulfuric Acid 66° Bé.	T/C	1.20	F.o.b.	.93	F.o.b.
Toluene	T/T	4.08	Del.	3.47	F/E
Xylene	T/T	4.50	Del.	3.82	Del. (Detroit)
Sulfamic Acid(c)	C/L Drs.	17.95	Del.	14.75	Del.
<u>Note:</u>	T/C -	tank car	Drs. -	drums	
	T/T -	tank truck	F/E -	freight equalized	
	C/L -	carload	Del. -	delivered	

(a) Currently quoted Canadian prices

(b) Prices quoted Oil, Paint and Drug Reporter, March 1961

(c) U.S. price plus 15% duty (208t) plus freight from border of 1¢ lb.

(d) Canadian price includes 30¢ freight, U.S. price 15¢ freight

(e) All prices f.o.b., no freight included

Table 3

Canadian and U.S. Selling Prices of Surface-Active Agents and
Cost of Materials Used in Their Manufacture

Chemicals	No. lb. Used	Canada			U.S.A.		
		Price \$/cwt.	Amount \$	Approx. Selling Price \$/cwt.	Price \$/cwt.	Amount \$	Approx. Selling Price \$/cwt.
Ethoxylated Nonyl Phenol 4 mols. E.O.							
Tripropylene Phenol	65.0	4.53	2.94		3.90	2.50	
	48.0	18.50	8.88		17.50	8.40	
			11.82			10.90	
Nonyl Phenol	55.7	11.82	6.58		10.90	6.07	
Ethylene Oxide	46.5	17.00	7.91	22.50	15.50	7.21	19.50
			14.49			13.28	
Above Sulphated to Anionic							
Ethoxylated Nonyl Phenol	80.5	14.49	11.66		13.28	10.69	
Sulfamic Acid(a)	19.7	17.95	3.54		14.75	2.91	
			15.20	17.00		13.60	13.75
Sodium Toluene Sulphonate(f)							
Toluene	54.3	4.08	2.22		3.47	1.86	
Sulphuric Acid	67.8	1.20	.81		.93	.63	
Caustic Soda 50%(b)	69.6	2.50	1.74		2.05	1.43	
			4.77	10.00		3.94	8.00
Sodium Xylene Sulphonate(g)							
Xylene	58.5	4.50	2.63		3.82	2.23	
Sulphuric Acid	63.2	1.20	.76		.93	.59	
Caustic Soda(b)	65.0	2.50	1.62		2.05	1.33	
			5.01	10.50		4.15	8.00

	No. lb. Used	Canada			U.S.A.		
		Price \$/cwt.	Amount \$	Approx. (e) Selling Price \$/cwt.	Price \$/cwt.	Amount \$	Approx. (e) Selling Price \$/cwt.
Coconut Monoethanolamide							
Coconut Oil	101	14.00	14.14		14.50	14.65	
Methanol	23.2	11.31	2.62 16.76		9.80	2.27 16.92	
Credit Glycerine (d)	13.4	10.00	1.34 15.42		10.00	1.34 15.58	
CNO Methyl Ester (above)	86.7	15.42	13.40		15.58	13.51	
Monoethanolamine	26.5	27.00	7.15 20.55	27.00	25.00	6.62 20.13	27.00
Dodecyl Benzene Sulphonate (g)							
Dodecyl Benzene (c)	72.5	11.50	8.34		11.50	8.34	
Oleum	87.5	1.38	1.20		1.25	1.09	
Caustic Soda 50% (b)	36.0	2.50	.90 10.44		2.05	.74 10.17	
Credit Spent Acid	55.5	.40	2.22 8.22	16.00 (h)	.45	2.22 7.95	14.00 (h)

121

(a) U.S. price plus duty 15% (208t) plus freight from border 1.00/cwt.
 (b) Canadian price includes 30¢ freight; U.S. includes 15¢ freight
 (c) All prices f.o.b. shipping point, no freight included
 (d) Price shown theoretical. In practice price obtained in Canada about 5¢ lb.
 (e) Prices for 40,000 lb. T/F f.o.b. plant
 (f) Made and shipped 30% active, sold 100% active
 (g) Made and shipped 40% active, sold 100% active
 (h) Price delivered

APPENDIX IIPrincipal Relevant Recommended Items

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
15.10	Industrial mixtures, including reaction blends, of fatty acids not containing 90 per cent or more by weight of any one acid; acid oils from refining, n.o.p.; industrial mixtures, including reaction blends, of fatty alcohols not containing 90 per cent or more by weight of any one alcohol			
	(1) Acid oils	Free	10	25
	(2) Fatty acids except tall oil fatty acids	10	15	25
	(3) Fatty alcohols	Free	Free	Free
	(4) Tall oil fatty acids	Free	Free	Free
15.11	Glycerol and glycerol lyes:			
	(1) Other than the following	Free	Free	Free
	(2) Glycerol, other than crude	10	15	25
25.03	Sulphur of all kinds, other than sublimed sulphur, precipitated sulphur and colloidal sulphur	Free	Free	Free
28.17	Sodium hydroxide (caustic soda); potassium hydroxide (caustic potash); peroxides of sodium or potassium:			
	(1) Potassium hydroxide (caustic potash)	7 $\frac{1}{2}$	7 $\frac{1}{2}$	20
	(2) Potassium peroxide	Free	15	25
	(3) Sodium hydroxide (caustic soda)	10	15	25
	(4) Sodium peroxide	Free	15	25
28.32	Chlorates and perchlorates:			
	(1) Other than the following	Free	15	25
	(2) Potassium chlorate	10	15	25
	(3) Sodium chlorate	Free	10	25

	<u>Goods Subject to Duty and Free Goods</u>	<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
28.39	Nitrites and nitrates:			
	(1) Other than the following	Free	15	25
	(2) Bismuth subnitrate (basic bismuth nitrate)	10	15	25
	(3) Cobalt nitrate other than A.R. grade	10	15	25
	(4) Potassium nitrate	Free	Free	Free
	(5) Sodium nitrate containing, in the dry state, more than 16.3 per cent by weight of nitrogen	Free	Free	Free
	(6) Sodium nitrite	Free	12 $\frac{1}{2}$	25
	(7) Strontium nitrate	Free	Free	Free
28.44	Fulminates, cyanates and thiocyanates	Free	15	25
29.01	Hydrocarbons:			
	(1) Other than the following	Free	15	25
	(2) Acetylene	10	15	25
	(3) Benzene	Free	Free	Free
	(4) Butadiene	Free	Free	Free
	(5) Butanes	10	12 $\frac{1}{2}$	25
	(6) Butylenes (butenes)	Free	Free	Free
	(7) Camphene	Free	Free	Free
	(8) Cyclopropane, for anaesthetic purposes	10	15	25
	(9) Dipentene	Free	Free	Free
	(10) Essential oils, natural or synthetic, of this item	Free	7 $\frac{1}{2}$	7 $\frac{1}{2}$
	(11) Ethylene	Free	Free	Free
	(12) Hexanes	Free	Free	Free
	(13) alpha Methylstyrene	10	15	25
	(14) Naphthalene	10	15	25
	(15) Deleted			
	(16) Pinenes	Free	Free	Free
	(17) Propane	10	12 $\frac{1}{2}$	25
	(18) Propylene	Free	Free	Free
	(19) Styrene	10	15	25
	(20) p-Terphenyl	10	15	25
	(21) Toluene	Free	Free	Free
	(22) Xylenes	Free	Free	Free
29.03	Sulphonated, nitrated or nitrosated derivatives of hydrocarbons:			
	(1) Other than the following	Free	15	25
	(2) Ammonium dodecylbenzene sulphonate	10	15	25
	(3) Ammonium xylene sulphonate	10	15	25
	(4) Dinitrotoluene	10	15	25
	(5) Dodecylbenzene sulphonic acid	10	15	25
	(6) Nitrobenzene	10	15	25

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
29.03	(7) Potassium toluene sulphonate	10	15	25
(Cont'd)	(8) Sodium dodecylbenzene sulphonate	10	15	25
	(9) Sodium toluene sulphonate	10	15	25
	(10) Sodium xylene sulphonate	10	15	25
	(11) Toluene sulphonic acid	10	15	25
	(12) Trinitrotoluene (TNT)	10	15	25
29.04	Acyclic alcohols and their halogenated, sulphonated, nitrated or nitrosated derivatives:			
	(1) Other than the following	Free	15	25
	(2) Amyl alcohols	Free	Free	Free
	(3) Butyl alcohols	10	15	25
	(4) Essential oils, natural or synthetic, of this item	Free	7 $\frac{1}{2}$	7 $\frac{1}{2}$
	(5) Ethylene glycol	10	10	25
	(6) Hexylene glycols	10	15	25
	(7) Isopropyl alcohol	10	15	25
	(8) Methyl alcohol	5	10	20
	(9) Methylamyl alcohol (methyl isobutyl carbinol)	10	15	25
	(10) 2-Methyl-2-n-propyl-1,3-propanediol	10	15	25
	(11) Octanols	10	15	25
	(12) Pentaerythritol	10	15	25
	(13) n-Propyl alcohol	10	15	25
	(14) Propylene glycol	10	15	25
	(15) Sorbitol	10	15	25
29.06	Phenols and phenol-alcohols:			
	(1) Other than the following	Free	15	25
	(2) Bisphenol A	10	15	25
	(3) Butylated hydroxytoluene	10	15	25
	(4) Cresol, medicinal grade	10	15	25
	(5) ortho-Cresol	10	15	25
	(6) Didodecyl phenol	10	15	25
	(7) Dinonyl phenol	10	15	25
	(8) Dodecyl phenol	10	15	25
	(9) Essential oils, natural or synthetic, of this item	Free	7 $\frac{1}{2}$	7 $\frac{1}{2}$
	(10) Nonyl phenol	10	15	25
	(11) Phenol	10	15	25
	(12) Xylenols	10	15	25

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
29.08	Ethers, ether-alcohols, ether-phenols, (in part) ether-alcohol-phenols, alcohol peroxides and ether peroxides, and their halogenated, sulphonated, nitrated or nitrosated derivatives:			
	(6) Diethylene glycol	10	15	25
	(12) Essential oils, natural or synthetic, of this item	Free	7½	7½
	(17) Glycerol guaicolate (guaiacol glyceryl ether)	10	15	25
29.09	Epoxides, epoxyalcohols, epoxyphenols and epoxyethers, with a three or four member ring, and their halogenated, sulphonated, nitrated or nitrosated derivatives:			
	(1) Other than the following	Free	15	25
	(2) Epichlorohydrin	Free	Free	10
	(3) Ethylene oxide (epoxyethane)	10	15	25
	(4) Propylene oxide (1,2-epoxypropane)	10	15	25
29.18	Nitrous and nitric esters, and their halogenated, sulphonated, nitrated or nitrosated derivatives:			
	(1) Other than the following	Free	15	25
	(2) Essential oils, natural and synthetic, of this item	Free	7½	7½
	(3) Ethyl nitrite per gallon and	\$3.00 30	\$3.00 30	\$3.00 30
	(4) Mannitol hexanitrate	10	15	25
	(5) Nitroglycerol (glyceryl trinitrate)	10	15	25
	(6) Nitroglycol	10	15	25
	(7) Pentaerythritol tetranitrate	10	15	25
31.00	Fertilizers and certain enumerated goods: (in part)			
	(1) Fertilizers, formulated; goods for use as fertilizers; all the foregoing whether or not otherwise provided for in this item or elsewhere in Schedule A	Free	Free	Free
	(2) The following, when not for use as fertilizers:			
	Ammonium nitrate, whether or not coated or prilled	Free	Free	Free

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
34.02	Organic surface-active agents, surface-active preparations and washing preparations, whether or not containing soap	10	15	25
36.01	Propellent powders:			
	(1) Other than the following	Free	Free	Free
	(2) Black powder	5	10	20
36.02	Prepared explosives other than propellent powders:			
	(1) Other than the following	10	15	25
	(2) Based on ammonium nitrate	5	10	20
	(3) Based on chlorates and perchlorates	5	10	20
38.19	Chemical products and preparations of the chemical and allied industries (not including those consisting of mixtures of natural products other than compounded extenders for paints), n.o.p.; residual products of the chemical or allied industries, n.o.p.; not including soap nor pharmaceutical, flavouring, perfumery, cosmetic or toilet preparations:	10	15	25
	(1) Other than the following	10	15	25
	(2) Alkyl aryl hydrocarbons, unsulphonated reaction blends	5	10	25
	(3) Anti-freezing compounds	15	15	25
	(4) Blends of tall oil and tall oil pitch without other admixture	Free	Free	25
	(5) Catalyst preparations for cracking petroleum, other than the fluid-bed type	Free	Free	25
	(6) Coal tar dye intermediates in solvents	Free	Free	15
	(7) Fusel oil	Free	Free	15
	(8) Hydrolized animal matter for use as retarder	10	10	25
	(9) Mixtures of ethylene glycol and other glycols in which ethylene glycol predominates, for use in the manufacture of anti-freezing compounds	10	10	25
	(10) Naphthenates of aluminum, barium, calcium and chromium	Free	15	25
	(11) Residual lyes from the manufacture of wood pulp by the alkali or sulphate processes and their skimmings, dried or not	Free	Free	25
	(12) Tin-based stabilizers for synthetic resins	Free	Free	25

<u>Goods Subject to Duty and Free Goods</u>		<u>B.P.</u>	<u>M.F.N.</u>	<u>G.T.</u>
39.03	Regenerated cellulose; cellulose			
(in part)	nitrate, cellulose acetate and other cellulose esters, cellulose ethers and other chemical derivatives of cellulose, plasticised or not (for example, collodions, celluloid); not including vulcanised fibre:			
	(a) Without admixture; aqueous emulsions, aqueous dispersions or aqueous solutions, without other admixture; cellulose nitrate with not more than 35 per cent by weight of a dampening agent other than an organic solvent of paragraph (b):			
	1. Other than the following	Free	Free	10
	2. Cellulose nitrate, dynamite grade	5	10	20
	3. Sodium carboxymethyl cellulose	10	15	25
	(b) In organic solvents where the weight of the solvent, except for col- lodions, does not exceed 50 per cent of the weight of the solution, without other admixture	$7\frac{1}{2}$	$7\frac{1}{2}$	20

APPENDIX IIILists of Products and Manufacturers

<u>Table</u>		<u>Page</u>
1	Primary Textiles Institute of Canada's list of surfactants to be included in B.T.N. 34.02	130
2	Manufacturers of surface-active agents, surface-active preparations and washing preparations	132
3	Factories Licensed to Manufacture Explosives, 1963	135

APPENDIX IIIPrimary Textiles Institute of Canada's List of
Surfactants to be Included in B.T.N. 34.02Surface-Active Preparations & Compounds

<u>Product</u>	<u>Dealer</u>	<u>Source</u> ^(a)	<u>Composition</u>
Mercin H	Clough Chemical Co.	Canada	Adjusted Blend of Cresylates & Coupling Agents
Eccotex P	Texall Products Co.	U.S.A.	Blend of Terpene Solvents and Amide Condensates
Super Barisol BRN	Dexter Chemical Corp.	U.S.A.	Phosphated Long Chain Alcohols
Atcosoft N	Metro-Atlantic (Canada) Ltd.	U.S.A.	Amine condensate- Anionic
Detergent MXP	Monsanto	Canada	Built polyoxy- ethylene ester
Kloramine	Canadian Aniline & Extract Co.	Canada	Ethylene Oxide condensate
Detergent X2	Trilon	Canada	Alkylarylsulphonate
Silvertone			High molecular
Softener	Quaker City	Canada	ester
Dura Beau 21W	Scholler Bros.	Canada	Lanolin emulsion
Fasco D.C.	Clough Chemicals	Canada	Mixture Cetyl oleyl Alcohol
Fulonex A.P.	Canadye Corp.	Canada	Sol Isomeric Cresols
Scourex	Texavon Chemical	Canada	Anionic Mixture Detergent and Solvent
Texo D.C.	Texavon Chemical	Canada	Anionic Ester
Fulling oil			Sulfonated Castor
No. 4	Texavon Chemical	Canada	Oil Base
Resoline N.C.P.	Sandoz	Switzer- land	Mixture Anionic detergents solvents
Sandopan A.	Sandoz	Switzer- land	Sulphated F. Alcohol
Texo P.O.	Texavon	Canada	Anionic ester
Nevapon TH		Canada	
Mercerol QW		Canada	
Penetrianol #60		Canada	
Permawet 203		Canada	
Rexol 22/100		Canada	
Sandopan DTC		Switzer- land	
Thorowet		Canada	
Dupanol LS		U.S.A.	
LP 141		Canada	
Triton X100		U.S.A.	
Triton X102		U.S.A.	
Triscamine OT		Canada	
Levegal PT	Verona		

Surface-Active Preparations & Compounds

<u>Product</u>	<u>Dealer</u>	<u>Source</u> ^(a)	<u>Composition</u>
Stantex 1032	Standard		
Sandofix WE	Sandoz		
Tanavol	Chemtex		
Levogen HW	Verona		
Compound 8-S	Du Pont		
Mittin FF	Geigy		
Migasol PJ	Ciba		
Aquomollin FE	Verona		
Fixanol PN	C.I.L.		

^(a) Indicated location of supply, not necessarily of manufacture

Source: Transcript, Vol. 102, p. 15343

Table 2

Manufacturers of Surface-Active Agents,
Surface-Active Preparations and Washing Preparations

Section IType of ProductQuebec

Bon Ami Limited	13719 Notre Dame St. E., Montreal	R
Canadian Permag Products Ltd.	300 Arran Ave., St. Lambert	I
Darling & Brady Limited	1971 Richardson St., Montreal	R,I
Economic Product Ltd.	281 St. Zotique W., Montreal	I
Groulx & Robertson Inc.	6508 Durocher, Montreal	I
Handy Chemicals Ltd.	224 St. Denis St., St. Lambert	R,I
Hart Products Reg'd.	429 St. James St. W., Montreal	I
Javex Company Limited	960 Outremont, Montreal	R,I
Les Produits Nor-Do	5210 Resther, Montreal	I
Myriad Detergent Inc.	44 Dorchester, Quebec	R
Savon Majestic Ltée.	1853 Moreau St., Montreal	R,I
Snap Manufacturing Ltd.	9680 St. Lawrence Blvd., Montreal	R,I
Specialties Economiques Ltée.	500-17th St., Quebec	I
Texavon Chemical Co. Ltd.	85-A Vitre St. W., Montreal	I

Ontario

Atlas Chemical Co. Ltd.	38 McGee St., Toronto	I
Canada Packers Limited	525 Front St. E., Toronto	R,I
Canadian Sanitary Supplies Ltd.	107 Victoria Ave. N., Hamilton	I
Chemical Developments of Canada Ltd.	Langford Mills	R,I
Colgate-Palmolive Limited	64 Colgate Ave., Toronto	R,I
Copeland Laboratories Ltd.	46 Brydon, Rexdale	I
Crystal Chemicals Ltd.	124 Menville Rd., Toronto	I
Delta Chemicals Ltd.	5 Edward, Brantford	R,I
Diversey Corporation (Canada) Ltd.	Port Credit	I
Douglas-Hogarth Co.	R.R. No. 5, Brantford	I
Drackett Co. of Canada Ltd., The	104 Jutland Rd., Toronto	R
Easy Way Products	32 Winnett St., Woodstock	I
Economics Laboratory (Canada) Ltd.	30 Edgar St., Toronto	R,I
Empire Chemical Co.	Bolton	I
Fairbanks Soap Co. Ltd.	353 Eastern Ave., Toronto	R,I
Hunnisett, H.S. Ltd.	200 Wicksteed Ave., Toronto	I
Huntington Laboratories Ltd.	86 Parliament St., Toronto	I
Javex Company Limited	99 Vanderhoof Ave., Toronto	R,I
Kert Mfg. Co. Ltd.	135 Logan Ave., Toronto	R,I
Lavoline Cleanser Limited	505 Eastern Ave., Toronto	R,I
Lawrason, S.F. & Co. Ltd.	180 Adelaide St. S., London	R,I
Leeds Soaps Limited	27 Newcastle, Toronto	I
Lever Brothers Limited	299 Eastern Ave., Toronto	R,I
London Soap Co. Ltd., The	197 South St., London	I
Luster-Sheen Laboratories	733 King St. E., Hamilton	R,I

Table 2
(Cont'd)Section I
(Cont'd)Type of
ProductOntario - (Cont'd)

McKague Chemical Co. Ltd.	1119-A Yonge St., Toronto	I
Mack's Laundry Specialty Co.	Almonte	I
Marvelene Co.	10 East Avenue N., Hamilton	I
Marvelo Chemicals Ltd.	481 Sammon, Toronto	R,I
Ontario Chemicals Limited	51 Clarkson Ave., Toronto	I
Page Brothers Products Ltd.	462 Sherbourne, Toronto	I
Procter & Gamble Company of Canada Ltd., The	Burlington St. E., Hamilton	R,I
Purex Corporation Ltd.	44 Clayson Rd., Weston	R,I
Sani Bleach Co.	205 Birge St., Hamilton	R,I
S.O.S. Mfg. Co. of Canada Ltd.	78 Tital Rd., Toronto	R
Taylor Soaps Perfumes Ltd.	30 Kern Rd., Don Mills	R
Whitehouse Soaps & Chemicals	Malley Rd., Scarborough	I
Wonderful Soap Co. Ltd.	16 Fountain St. W., Guelph	R,I

Manitoba

Beaver Soaps Limited	1377 Winnipeg Ave., Winnipeg	I
Empire Soap Co. Ltd.	594 Des Meurons Ave., St. Boniface	R,I
Javex Company Limited	835 Marion St., St. Boniface	R,I

Alberta

Javex Company Limited	Edmonton	R,I
Soapone Products Ltd.	12734-63rd St., Edmonton	I

British Columbia

Carpenter & Harrison Ltd.	1210 Wharf, Victoria	R
Javex Company Limited	Stewart St., Vancouver	R,I
Western Soap Co. Ltd.	1814 Pandora St., Vancouver	R,I

Section II Manufacturers not Listed in D.B.S. Catalogue No. 46-214Ontario

Eaton Chemical & Dyestuff Co.	162 Queen Quay E., Toronto	R,I
General Soap Co. Ltd., E.P.	127 Manville Rd., Scarborough	I
Hollingshead Co. of Can. Ltd.	1 Mobile Dr., Toronto	R,I
Nuodex Products of Canada Ltd.	34 Industrial St., Toronto	I
Sanitary Products Company Ltd.	268 Ontario St., Toronto	I
Shulton of Canada Limited	1390 Don Mills Rd., Don Mills	R

Table 2
(Cont'd)Section II
(Cont'd)Type of
ProductOntario - (Cont'd)

Swift Canadian Company Ltd.	1960 St. Clair Ave. W., Toronto	I
Union Carbide Canada Limited	123 Eglinton Ave. E., Toronto	I
Wood, G.H., & Company Ltd.	Queen Elizabeth Way, Toronto	R,I
Yardley of London (Canada) Ltd.	7 Curity Ave., Toronto	R
Canadian Aniline & Extract Co. Ltd.	162 Ward Ave., Hamilton	I
Nopco Canada Limited	123 St. George St., London	I
Tennier Chemical & Sales Company	124 Jackson St. E., Hamilton	I
Stanley Home Products of Canada Ltd.	140 Ann St., London	R
Drew, E.F., & Company Limited	Ajax	I
Atlas Powder Company Canada Ltd.	135 Elgin St., Brantford	I
Hart Products Company of Canada Ltd.	Guelph	I
Dustbane Mfg. Company Limited	88 Metcalfe St., Ottawa	R,I
Jergens, Andrew, Co. Ltd.	Perth	R,I
Rohm & Haas Company of Canada Ltd.	2 Manse Rd., West Hill	I

Quebec

Allied Chemical Canada Limited	1450 City Councillors St., Montreal	I
Aumour Limited	431 St. Helen St., Montreal	R
Beaver Products Company Limited	1775 Edward-Laurin Blvd., Montreal	R
Canadian Cleaning Suply Co. Ltd.	1732 Notre Dame St. W., Montreal	I
Cartier Chemical Co. Ltd.	1375 Cote Vertu, Montreal	I
Lalonde, Frank P., Ltd.	105 Metropolitan Blvd., Dorval	I
Monsanto Canada Limited	425 St. Patrick St., LaSalle	I
Rawleigh, W.T., Company Limited	4005 Richelieu St., Montreal	R
Watkins Products Inc.	350 St. Roch St., Montreal	R
Witco Chemical Co. Canada Ltd.	2143 St. Patrick St., Montreal	R,I
Cadillac Products Reg'd	373 Des Sables St., Quebec	R
Colloids of Canada Limited	180 St. Hubert St., Granby	I

British Columbia

Lions Gate Chemicals Limited	285 - 5th Ave. E., Vancouver	I
Zero Manufacturing Company Ltd.	533 Johnson St., Victoria	R

Note: R - Retail preparations
 I - Industrial/Institutional preparations
 RI - Retail, industrial/institutional preparations

Source: Joint submission of the four detergent manufacturers

Factories Licensed to Manufacture Explosives,
1963

<u>Owner</u>	<u>Location of Factory</u>	<u>General Nature of Product</u>
W.F. Bishop & Son Limited	Unionville, Ont.	Fireworks
Canadian Arsenals Limited	St. Paul l'Ermite, Que.	Military ammunition
Canadian Arsenals Limited	Valcartier, Que.	Military ammunition
Canadian Arsenals Limited	Nitro, Que.	Military explosives
Canadian Bristol Aerojet Limited	Rockwood, Man.	Propellents
Canadian Industries Limited	Beloeil, Que.	Blasting explosives, fuse powders, nitrocompounds
Canadian Industries Limited	Brainerd, Man.	Blasting explosives
Canadian Industries Limited	Brownsburg, Que.	Ammunition, detonators, blasting accessories, pyrotechnic signals
Canadian Industries Limited	Calgary, Alta.	Blasting explosives
Canadian Industries Limited	James Island, B.C.	Blasting explosives
Canadian Industries Limited	Nobel, Ont.	Blasting explosives
Canadian Industries Limited	Seven Islands, Que.	Blasting explosives
Canadian Industries Limited	Sudbury, Ont.	Blasting explosives
Canadian Safety Fuse Company Limited	Brownsburg, Que.	Safety fuse, detonating fuse, blasting accessories
Consolidated Mining and Smelting Company of Canada Limited	Kimberley, B.C.	Blasting explosives
Cyanamid of Canada Limited	Niagara Falls, Ont.	Nitroguanidine
Delta Explosives Limited	St. Joseph du Lac, Que.	Blasting explosives
Du Pont of Canada Limited	North Bay, Ont.	Blasting explosives
Gevelot of Canada Limited	Saskatoon, Sask.	Ammunition

Table 3
(Cont'd)

(Cont'd)

<u>Owner</u>	<u>Location of Factory</u>	<u>General Nature of Product</u>
Hand Chemical Industries Limited	Cooksville, Ont.	Fireworks and military pyrotechnics
Hand Chemical Industries Limited	Papineauville, Que.	Fireworks and military pyrotechnics
Iron Ore Company of Canada	Schefferville, Que.	Blasting explosives
Iron Ore Company of Canada	Wabush Lake, Nfld.	Blasting explosives
Remington Arms of Canada Limited	Long Branch, Ont.	Ammunition
Universal Pyrotechnics	Orangeville, Ont.	Highway fusees
Winchester-Western (Canada) Limited	Cobourg, Ont.	Ammunition
XL Explosives Limited	Hawkesbury, Ont.	Ammunition

Source: Department of Mines and Technical Surveys, Explosives Division, Annual Report



3 1761 11549407 2